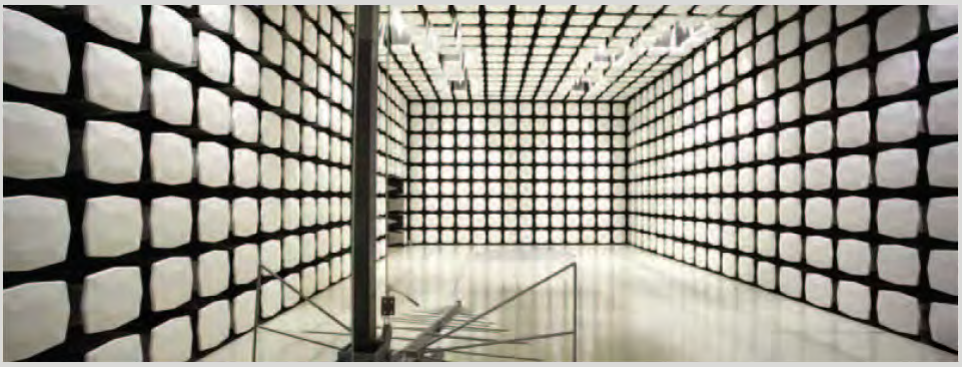
Microsoft Corporation

1601

FCC 15.407:2013

Report #: MCSO1665.1



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

WTD 12.5.23

CERTIFICATE OF TEST

Last Date of Test: August 19, 2013
Microsoft Corporation
Model: 1601

Emissions

Test Description	Specification	Test Method	Pass/Fail
Peak Transmit Power	FCC 15.407:2013	ANSI C63.10:2009	Pass
Emissions Bandwidth	FCC 15.407:2013	ANSI C63.10:2009	Pass
Peak Power Spectral Density	FCC 15.407:2013	ANSI C63.10:2009	Pass
Peak Excursion of the Modulation Envelope	FCC 15.407:2013	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.407:2013	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.407:2013	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2013	ANSI C63.10:2009	Pass
Frequency Stability	FCC 15.407:2013	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200629-0
NVLAP Lab Code: 200630-0

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
19201 120th Avenue NE, Suite 104
Bothell, WA 98011

Phone: (425) 984-6600 Fax: 984-6602

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834C-1).

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-1 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

KCC / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Hong Kong

OFTA – Recognized by OFTA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

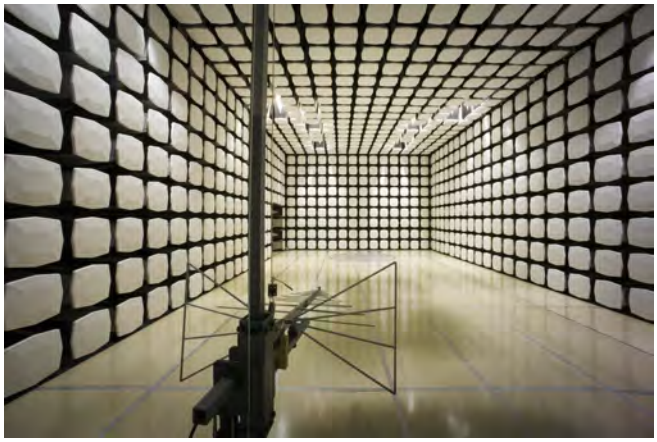
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

FACILITIES

REV 2013.06.28

Oregon	**California**	**New York**	**Minnesota**	**Washington**
Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs NC01-05,SU02,SU07 19201 120th Ave. NE Bothell, WA 98011 (425) 984-6600
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1
NVLAP				
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0



PRODUCT DESCRIPTION

WTD 12.5.23

Client and Equipment Under Test (EUT) Information

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Test Requested By:	Mike Boucher
Model:	1601
First Date of Test:	July 12, 2013
Last Date of Test:	August 19, 2013
Receipt Date of Samples:	July 08, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Handheld Computing Device with 802.11 a/g/b/n and Bluetooth radios.

Testing Objective:
To demonstrate compliance under FCC 15.407 for operation in the 5.2 GHz, 5.3 GHz and 5.6 GHz bands.

CONFIGURATIONS

Configuration MCSO1665- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	Lenovo	4171-53U	R9-N8A80 12/04

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1665- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622
Detachable Keyboard	Microsoft Corporation	X865049-001	016967623751

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone	No	1.2m	No	Handheld Computing Device	Ear buds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Ethernet	No	0.8m	No	Remote Laptop	USB Ethernet Adapter
Display Port	Yes	2.0m	No	Handheld Computing Device	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1665- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Handheld Computing Device	Microsoft Corporation	1601	017980332453

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	Lenovo	4171-53U	R9-N8A80 12/04

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Cat 5 cable	No	2.0m	No	USB Ethernet Adapter	Remote Laptop
DC Power Lead x2	No	1.5m	No	DC Power Supply	Handheld Computing Device
DC Power Lead x2	No	.5m	No	Multimeter	DC Power Supply
AC Power Cable	No	.8m	No	DC Power Supply	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1665- 4

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Handheld Computing Device	Microsoft Corporation	1601	006079632553

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	X865587-001	0D130T053ZA34
USB Ethernet Adapter	LinkSys	USB300M	CU906M715622
Detachable Keyboard	Microsoft Corporation	X865049-001	016967623751

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Headphone	No	1.2m	No	Handheld Computing Device	Ear buds
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Ethernet	No	0.8m	No	Remote Laptop	USB Ethernet Adapter
Display Port	Yes	2.0m	No	Handheld Computing Device	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MCSO1665- 5

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Handheld Computing Device	Microsoft Corporation	1601	018612332553

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Microsoft Corporation	X865587-001	0D130T0MM9334
USB Ethernet Adapter	LinkSys	USB300M	CU906M703796
Detachable Keyboard	Microsoft Corporation	81E5-13100R03	000883222254

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	No	0.5m	No	AC Adapter	AC Mains
DC Power	No	1.5m	No	AC Adapter	Handheld Computing Device
USB	Yes	0.1m	No	USB Ethernet Adapter	Handheld Computing Device
Audio	No	0.8m	No	Handheld Computing Device	Unterminated
Ethernet	No	1.5m	No	USB Ethernet Adapter	Unterminated
Display Port	Yes	1.8m	No	Handheld Computing Device	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	7/12/2013	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	7/12/2013	Peak Excursion of the Modulation Envelope	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	7/19/2013	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/24/2013	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	7/25/2013	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	8/19/2013	Emissions Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	8/19/2013	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	8/19/2013	Peak Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Power Table

This power table represents the power level settings used in the customer provided radio control test software during testing.

FCC 15.407		Test Description						
		Radiated Spurious	Peak Transmit Power	Peak Power Spectral Density	Emission Bandwidth	Peak Excursion	Band Edge Compliance	AC Powerline Conducted
Frequency Band	Channel	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)	Power (dBm)
5.15 to 5.25 GHz	Ch 36	12	10	10	10	12	12	12
	Ch 48	12	10	10	10	12	12	12
	Ch 36/40 - 40 MHz	8	8	8	8	12	12	12
	Ch 44/48-40 MHz	12	10	10	10	12	12	12
5.25 to 5.35 GHz	Ch 52	12	10	10	10	12	12	12
	Ch 64	12	12	12	12	12	12	12
	Ch 52/56-40 MHz	12	10	10	10	12	12	12
	Ch 60/64-40 MHz	12	10	10	10	12	12	12
5.47 to 5.725 GHz	Ch 100	12	12	12	12	12	12	12
	Ch 116	12	12	12	12	12	12	12
	Ch 120	*Prohibited*	*Prohibited*	*Prohibited*	*Prohibited*	*Prohibited*	*Prohibited*	*Prohibited*
	Ch 124							
	Ch 128							
	Ch 140	12	12	12	12	12	12	12
	Ch 100/104-40MHz	12	10	10	10	12	12	12
	Ch 132/136-40 MHz	12	10	10	10	12	12	12

Duty Cycle

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

The EUT operates at 100% Duty Cycle.

Peak Transmit Power - Antenna A-B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Peak Transmit Power - Antenna A-B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% duty cycle. Adapter cable loss of 1.3 dB added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

			Value	Limit
Chain A				
	20 MHz			
		802.11(n) MCS8		
		Ch 36, Low Channel 5180 MHz	7.492 dBm	< 17 dBm
		Ch 48, High Channel 5240 MHz	8.183 dBm	< 17 dBm
		Ch 52, Low Channel 5260 MHz	8.209 dBm	< 24 dBm
		Ch 64, High Channel 5320 MHz	8.491 dBm	< 24 dBm
		Ch 100, Low Channel 5500 MHz	11.698 dBm	< 24 dBm
		Ch 116, Mid Channel 5580 MHz	11.504 dBm	< 24 dBm
		Ch 140, High Channel 5700 MHz	10.233 dBm	< 24 dBm
		802.11(n) MCS15		
		Ch 36, Low Channel 5180 MHz	8.892 dBm	< 17 dBm
		Ch 48, High Channel 5240 MHz	8.556 dBm	< 17 dBm
		Ch 52, Low Channel 5260 MHz	8.15 dBm	< 24 dBm
		Ch 64, High Channel 5320 MHz	8.855 dBm	< 24 dBm
		Ch 100, Low Channel 5500 MHz	12.122 dBm	< 24 dBm
		Ch 116, Mid Channel 5580 MHz	11.963 dBm	< 24 dBm
		Ch 140, High Channel 5700 MHz	10.204 dBm	< 24 dBm
	40 MHz			
		802.11(n) MCS8		
		Ch 36/40, Low Channel 5190 MHz	6.298 dBm	< 17 dBm
		Ch 44/48, High Channel 5230 MHz	8.791 dBm	< 17 dBm
		Ch 52/56, Low Channel 5270 MHz	8.659 dBm	< 24 dBm
		Ch 60/64, High Channel 5310 MHz	7.597 dBm	< 24 dBm
		Ch 100/104, Low Channel 5510 MHz	10.946 dBm	< 24 dBm
		Ch 132/136, High Channel 5670 MHz	9.831 dBm	< 24 dBm
		802.11(n) MCS15		
		Ch 36/40, Low Channel 5190 MHz	7.505 dBm	< 17 dBm
		Ch 44/48, High Channel 5230 MHz	9.587 dBm	< 17 dBm
		Ch 52/56, Low Channel 5270 MHz	9.357 dBm	< 24 dBm
		Ch 60/64, High Channel 5310 MHz	8.254 dBm	< 24 dBm
		Ch 100/104, Low Channel 5510 MHz	11.532 dBm	< 24 dBm
		Ch 132/136, High Channel 5670 MHz	9.983 dBm	< 24 dBm
Chain B				
	20 MHz			
		802.11(n) MCS8		
		Ch 36, Low Channel 5180 MHz	7.319 dBm	< 17 dBm
		Ch 48, High Channel 5240 MHz	6.831 dBm	< 17 dBm
		Ch 52, Low Channel 5260 MHz	6.706 dBm	< 24 dBm
		Ch 64, High Channel 5320 MHz	7.546 dBm	< 24 dBm
		Ch 100, Low Channel 5500 MHz	10.218 dBm	< 24 dBm
		Ch 116, Mid Channel 5580 MHz	9.544 dBm	< 24 dBm
		Ch 140, High Channel 5700 MHz	8.132 dBm	< 24 dBm
		802.11(n) MCS15		
		Ch 36, Low Channel 5180 MHz	7.302 dBm	< 17 dBm
		Ch 48, High Channel 5240 MHz	6.795 dBm	< 17 dBm
		Ch 52, Low Channel 5260 MHz	6.697 dBm	< 24 dBm
		Ch 64, High Channel 5320 MHz	7.519 dBm	< 24 dBm
		Ch 100, Low Channel 5500 MHz	10.163 dBm	< 24 dBm
		Ch 116, Mid Channel 5580 MHz	9.98 dBm	< 24 dBm
		Ch 140, High Channel 5700 MHz	8.11 dBm	< 24 dBm
	40 MHz			
		802.11(n) MCS8		
		Ch 36/40, Low Channel 5190 MHz	4.441 dBm	< 17 dBm
		Ch 44/48, High Channel 5230 MHz	7.056 dBm	< 17 dBm
		Ch 52/56, Low Channel 5270 MHz	6.663 dBm	< 24 dBm
		Ch 60/64, High Channel 5310 MHz	6.456 dBm	< 24 dBm
		Ch 100/104, Low Channel 5510 MHz	8.328 dBm	< 24 dBm
		Ch 132/136, High Channel 5670 MHz	6.69 dBm	< 24 dBm
		802.11(n) MCS15		
		Ch 36/40, Low Channel 5190 MHz	5.755 dBm	< 17 dBm
		Ch 44/48, High Channel 5230 MHz	8.385 dBm	< 17 dBm
		Ch 52/56, Low Channel 5270 MHz	8.045 dBm	< 24 dBm
		Ch 60/64, High Channel 5310 MHz	7.297 dBm	< 24 dBm
		Ch 100/104, Low Channel 5510 MHz	9.859 dBm	< 24 dBm
		Ch 132/136, High Channel 5670 MHz	7.576 dBm	< 24 dBm

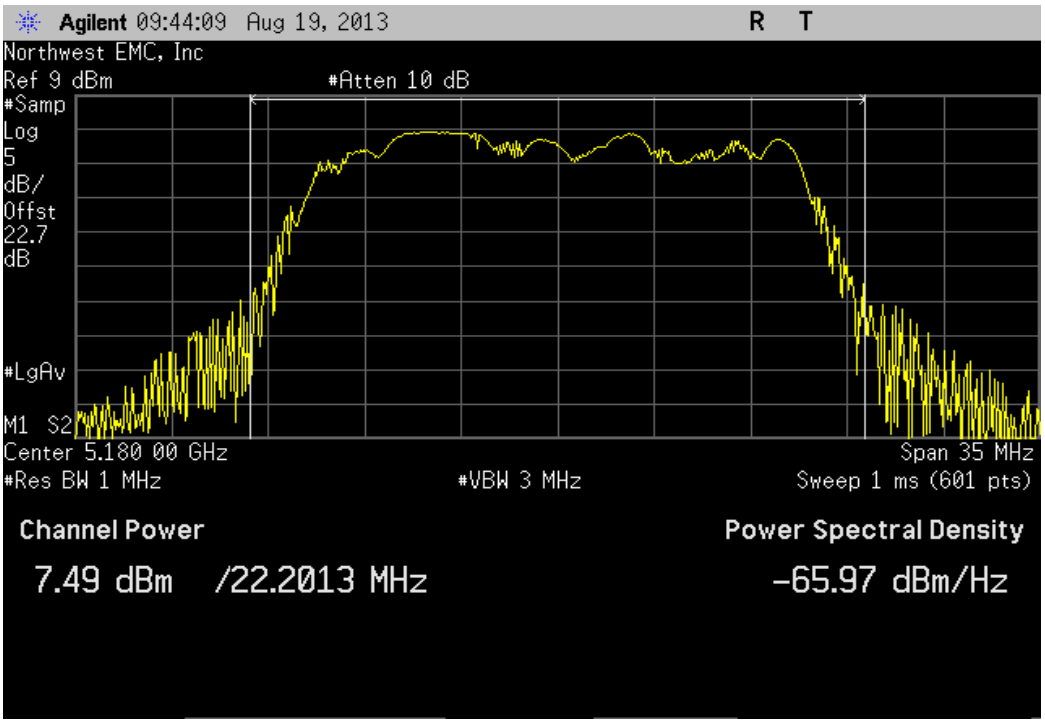
Chain AB

20 MHz	Chain A (dBm)	(mw)	Chain B (dBm)	(mw)	Summed Power (dBm)	Limit	Result
802.11(n) MCS8							
Ch 36, Low Channel 5180 MHz	7.492	5.61	7.319	5.39	10.41	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	8.183	6.58	6.831	4.82	10.57	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	8.209	6.62	6.706	4.68	10.53	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	8.491	7.06	7.546	5.68	11.05	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	11.698	14.78	10.218	10.51	14.03	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	11.504	14.14	9.544	9	13.64	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	10.233	10.55	8.132	6.5	12.32	< 24 dBm	Pass
802.11(n) MCS15							
Ch 36, Low Channel 5180 MHz	8.892	7.75	7.302	5.37	11.18	< 17 dBm	Pass
Ch 48, High Channel 5240 MHz	8.556	7.17	6.795	4.78	10.77	< 17 dBm	Pass
Ch 52, Low Channel 5260 MHz	8.15	6.53	6.697	4.67	10.49	< 24 dBm	Pass
Ch 64, High Channel 5320 MHz	8.855	7.68	7.519	5.65	11.25	< 24 dBm	Pass
Ch 100, Low Channel 5500 MHz	12.122	16.3	10.163	10.38	14.26	< 24 dBm	Pass
Ch 116, Mid Channel 5580 MHz	11.963	15.71	9.98	9.95	14.09	< 24 dBm	Pass
Ch 140, High Channel 5700 MHz	10.204	10.48	8.11	6.47	12.29	< 24 dBm	Pass
40 MHz							
802.11(n) MCS8							
Ch 36/40, Low Channel 5190 MHz	6.298	4.26	4.441	2.78	8.48	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	8.791	7.57	7.056	5.08	11.02	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	8.659	7.34	6.663	4.64	10.78	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	7.597	5.75	6.456	4.42	10.07	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	10.946	12.43	8.328	6.8	12.84	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	9.831	9.62	6.69	4.67	11.55	< 24 dBm	Pass
802.11(n) MCS15							
Ch 36/40, Low Channel 5190 MHz	7.505	5.63	5.755	3.76	9.73	< 17 dBm	Pass
Ch 44/48, High Channel 5230 MHz	9.587	9.09	8.385	6.89	12.04	< 17 dBm	Pass
Ch 52/56, Low Channel 5270 MHz	9.357	8.62	8.045	6.38	11.76	< 24 dBm	Pass
Ch 60/64, High Channel 5310 MHz	8.254	6.69	7.297	5.37	10.81	< 24 dBm	Pass
Ch 100/104, Low Channel 5510 MHz	11.532	14.23	9.859	9.68	13.79	< 24 dBm	Pass
Ch 132/136, High Channel 5670 MHz	9.983	9.96	7.576	5.72	11.95	< 24 dBm	Pass

Peak Transmit Power - Antenna A-B

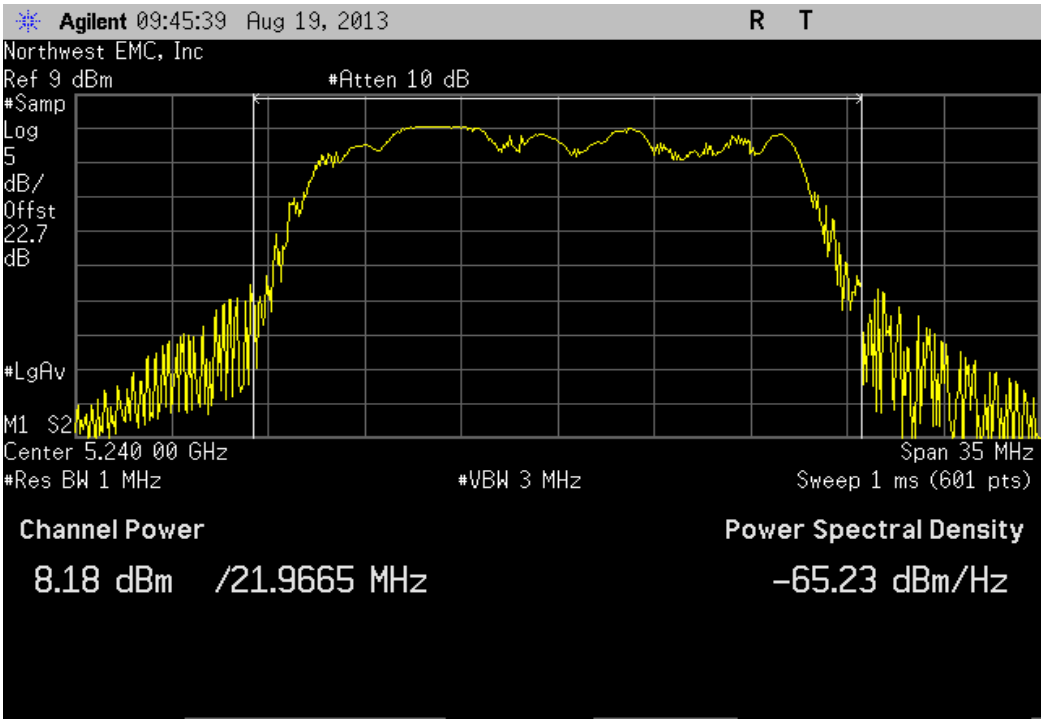
Chain A, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	
				7.492 dBm	< 17 dBm	Pass



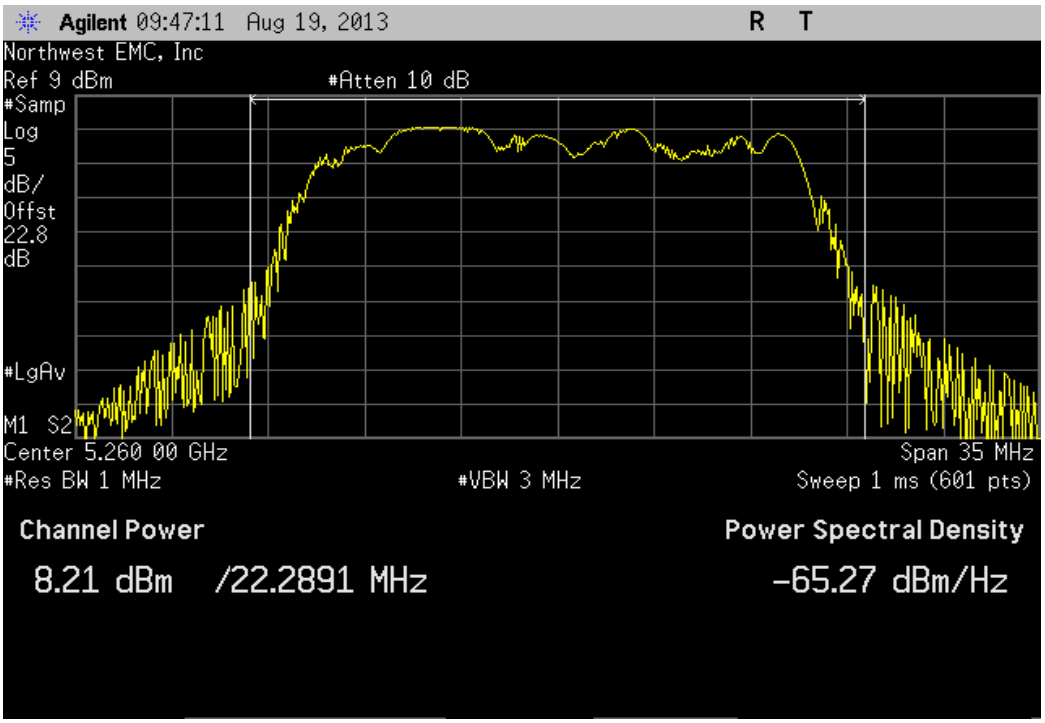
Chain A, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

				Value	Limit	
				8.183 dBm	< 17 dBm	Pass

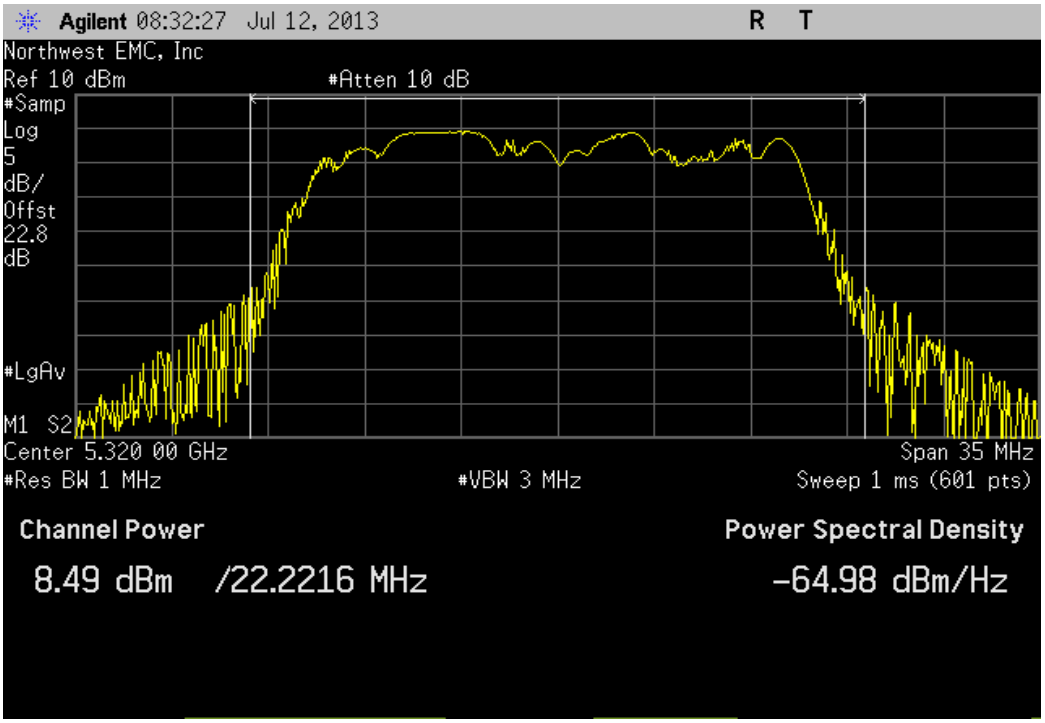


Peak Transmit Power - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz						
				Value	Limit	
				8.209 dBm	< 24 dBm	Pass



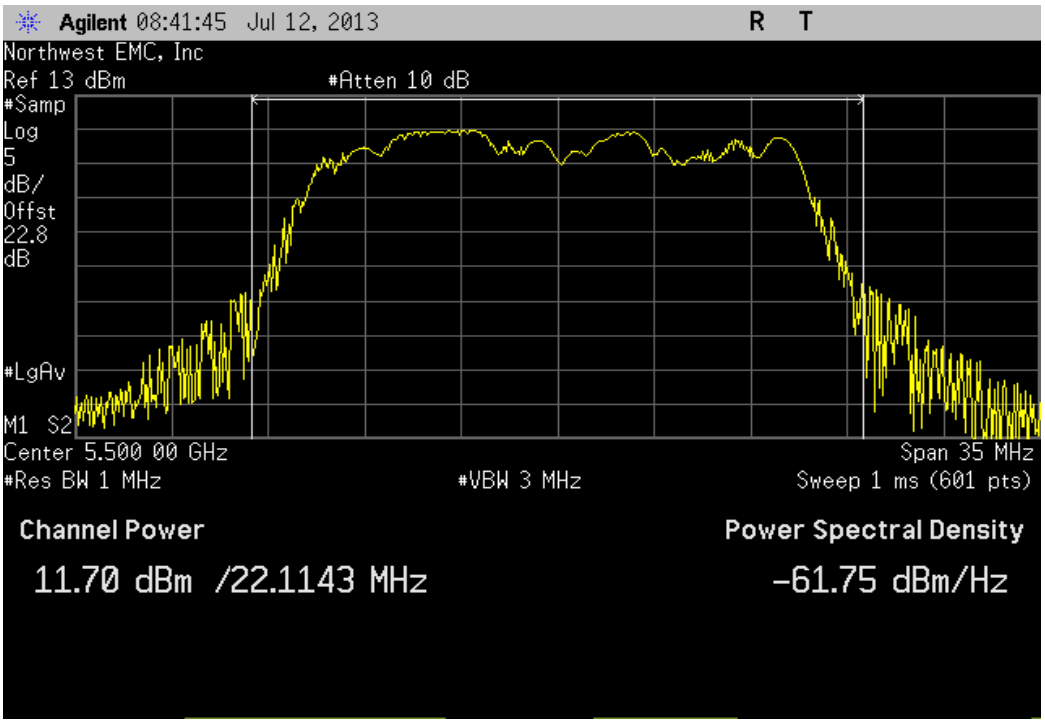
Chain A, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz						
				Value	Limit	
				8.491 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

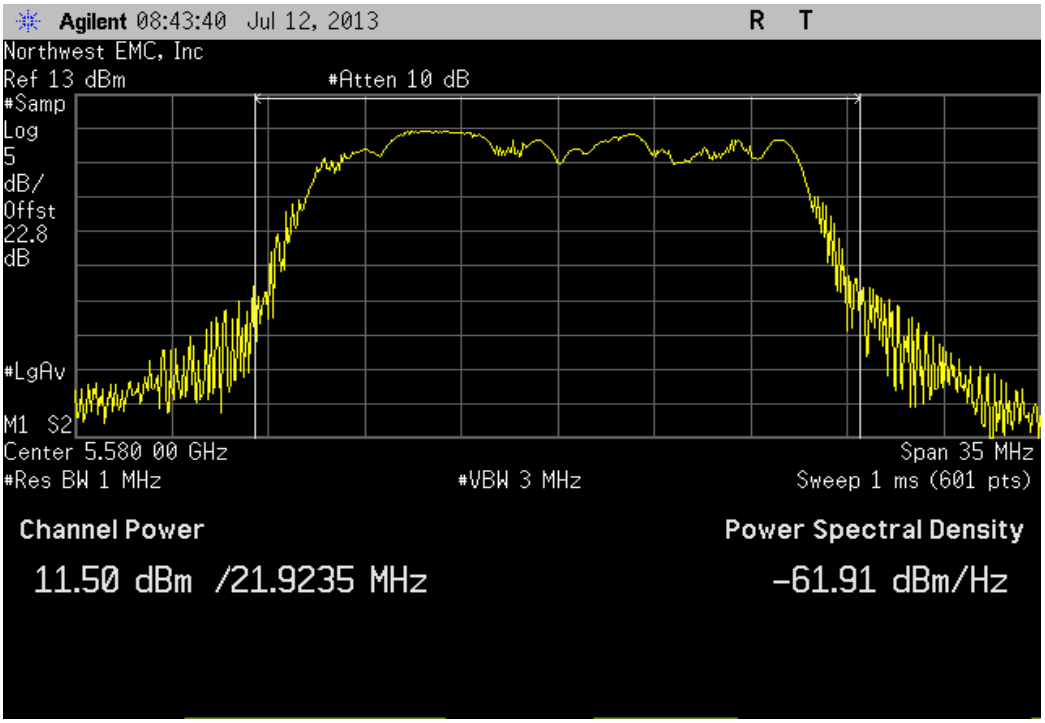
Chain A, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	
				11.698 dBm	< 24 dBm	Pass



Chain A, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

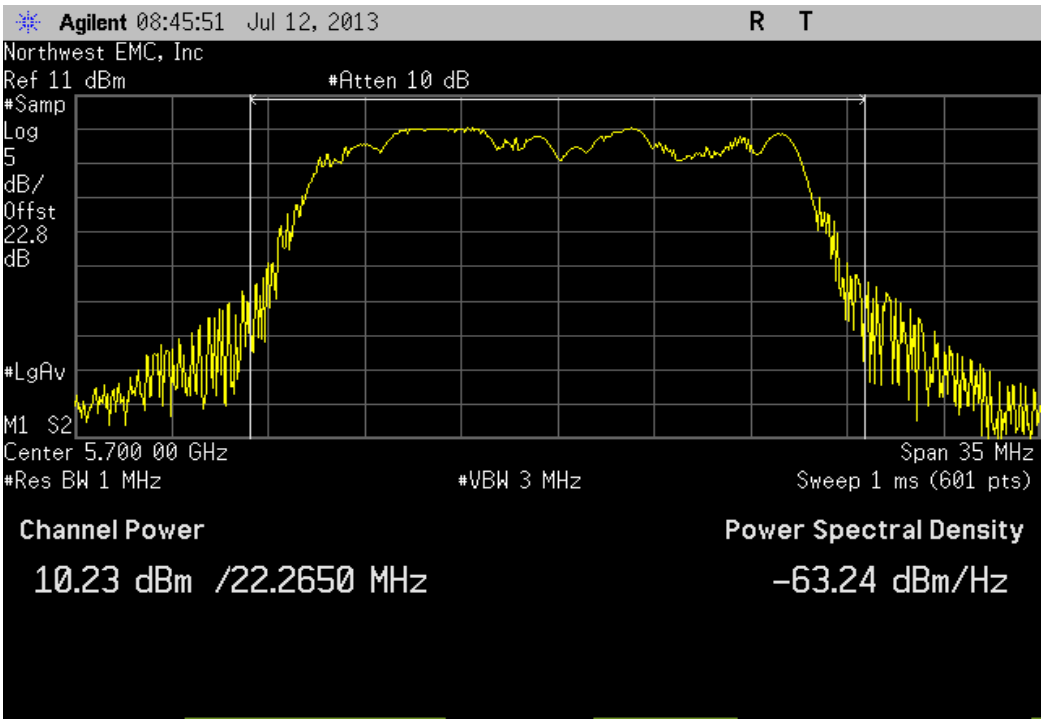
				Value	Limit	
				11.504 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

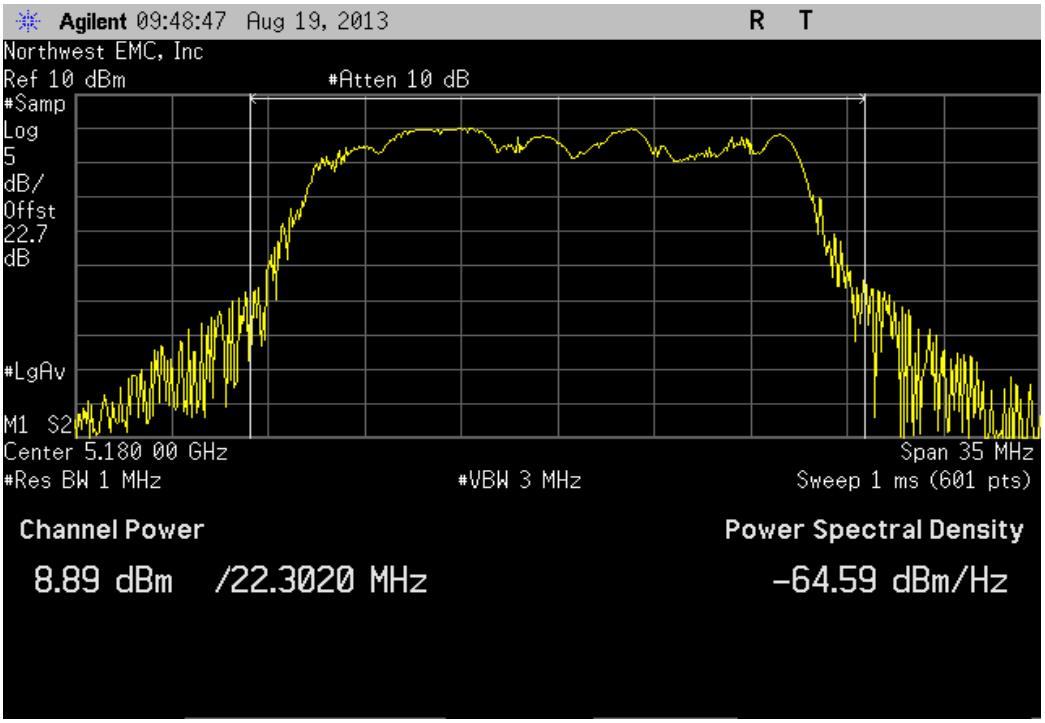
Chain A, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	
				10.233 dBm	< 24 dBm	Pass



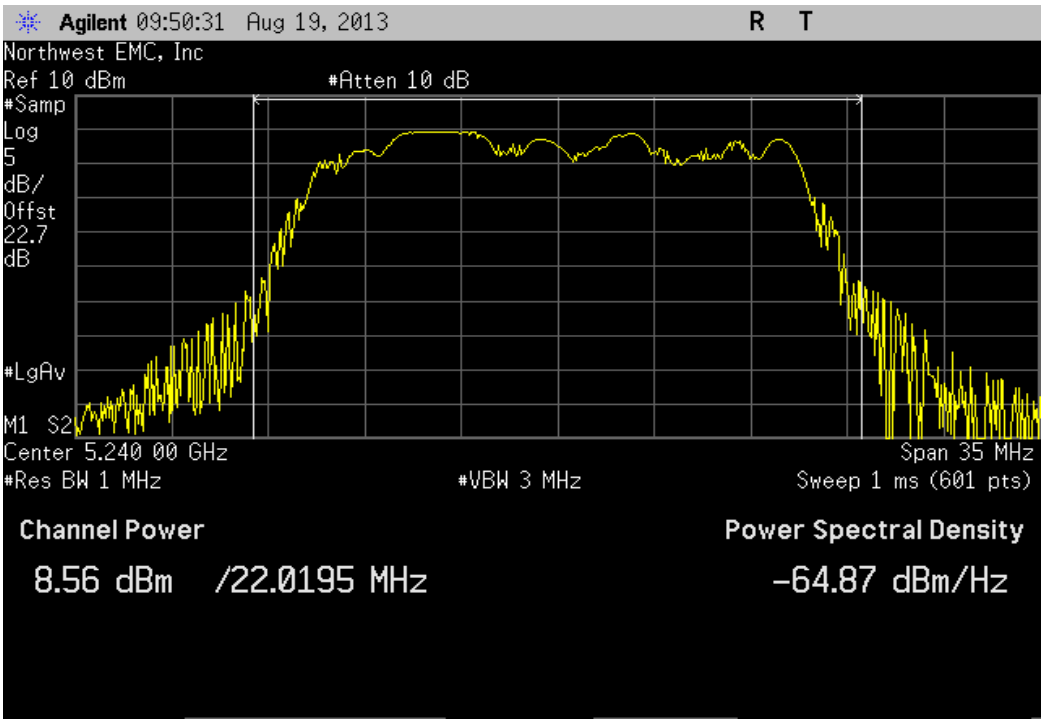
Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

				Value	Limit	
				8.892 dBm	< 17 dBm	Pass

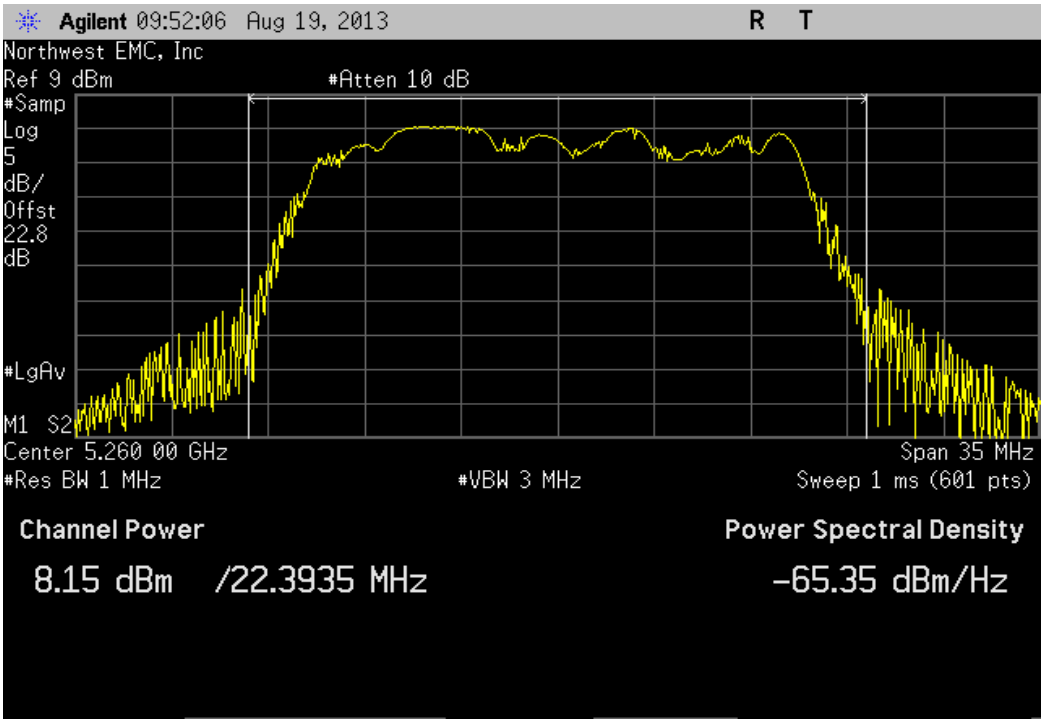


Peak Transmit Power - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz						
				Value	Limit	
				8.556 dBm	< 17 dBm	Pass



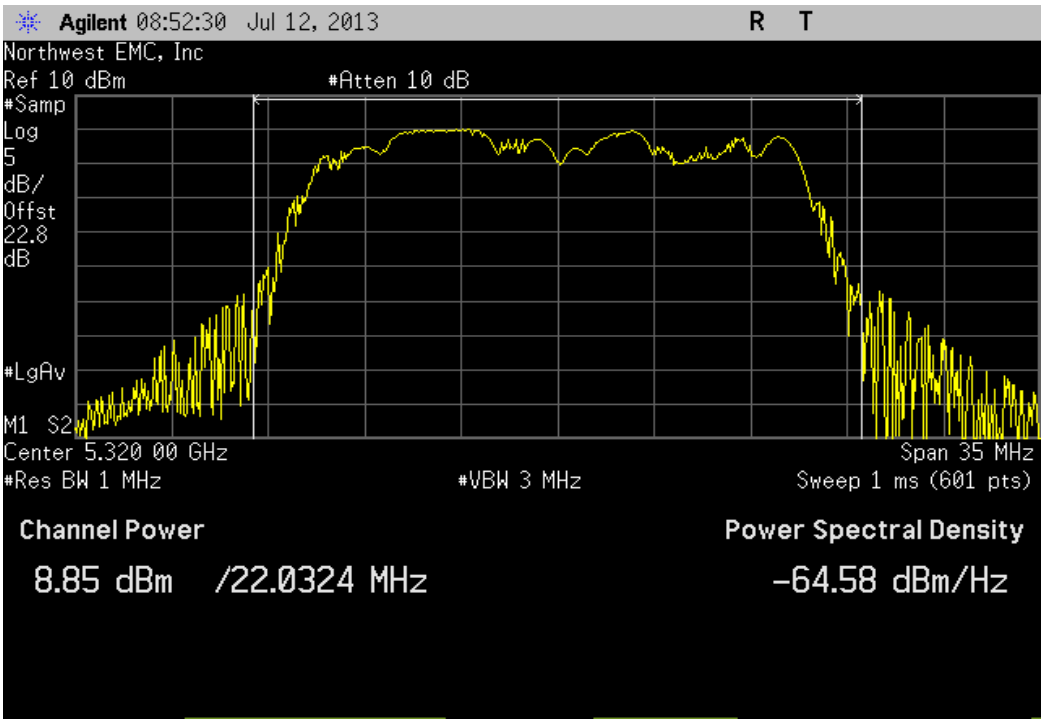
Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz						
				Value	Limit	
				8.15 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

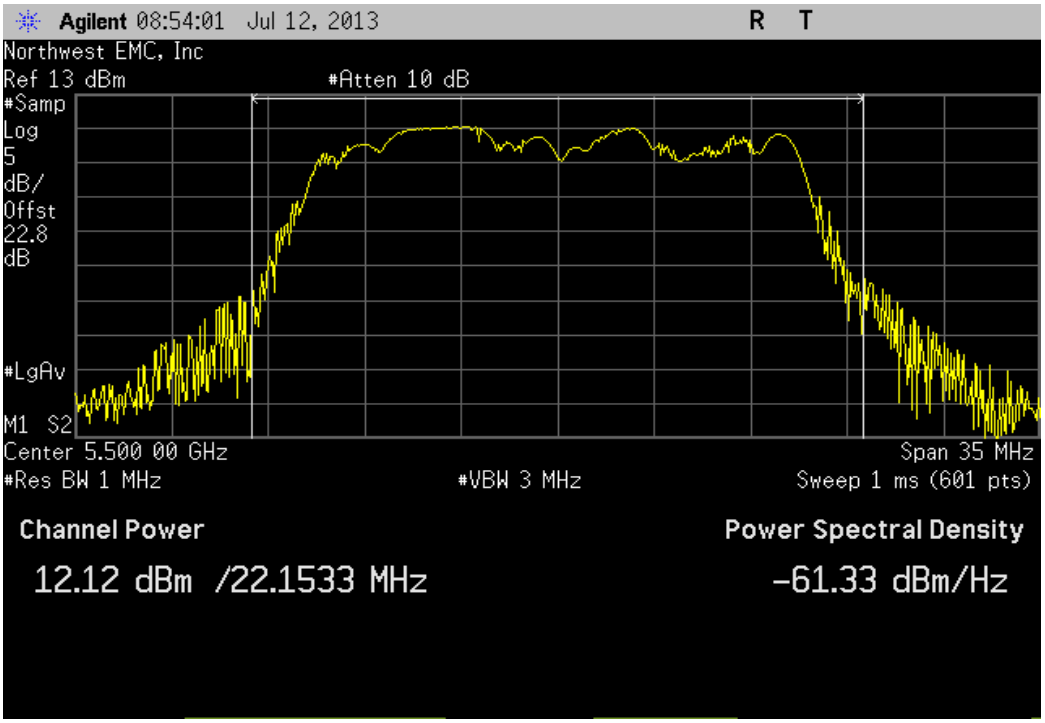
Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz

				Value	Limit	
				8.855 dBm	< 24 dBm	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz

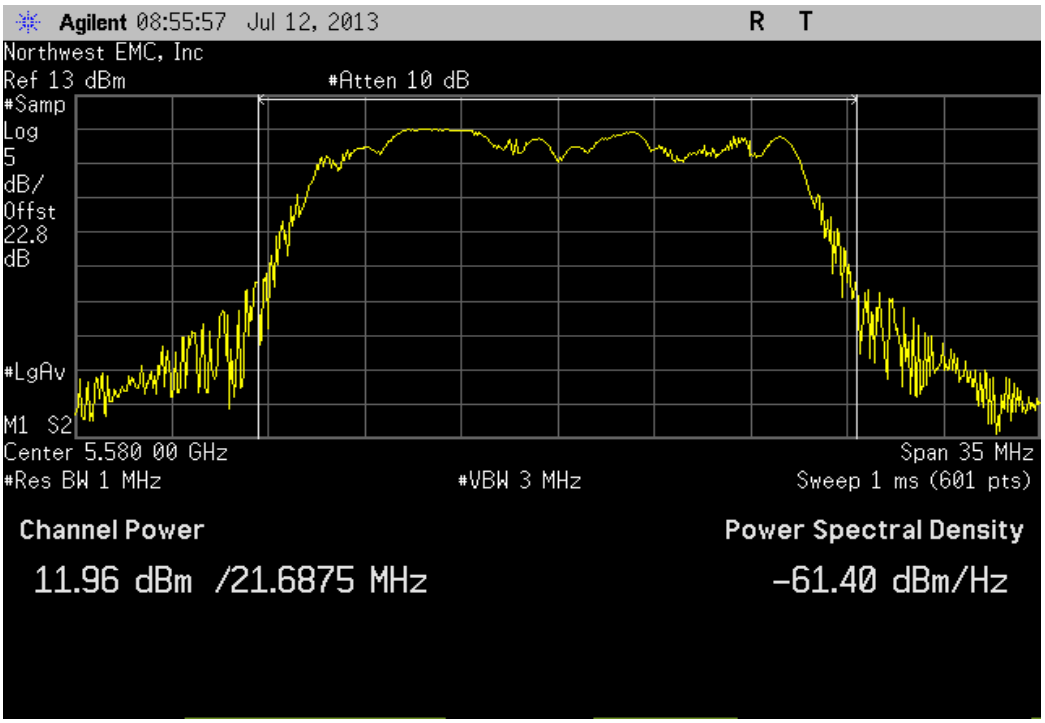
				Value	Limit	
				12.122 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

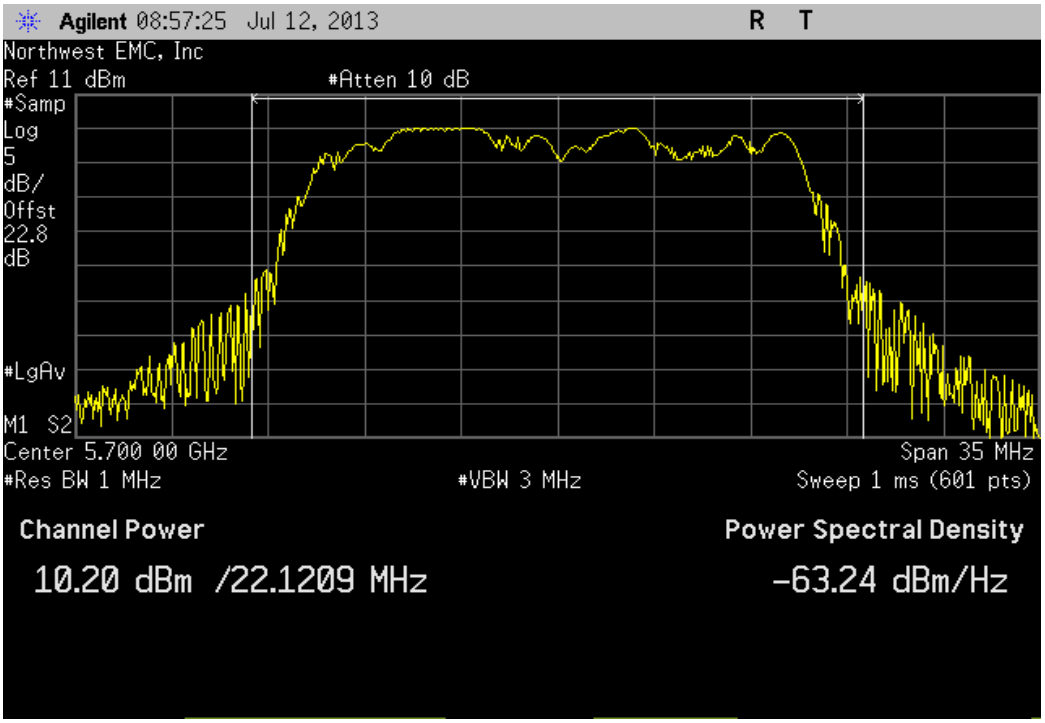
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	
				11.963 dBm	< 24 dBm	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

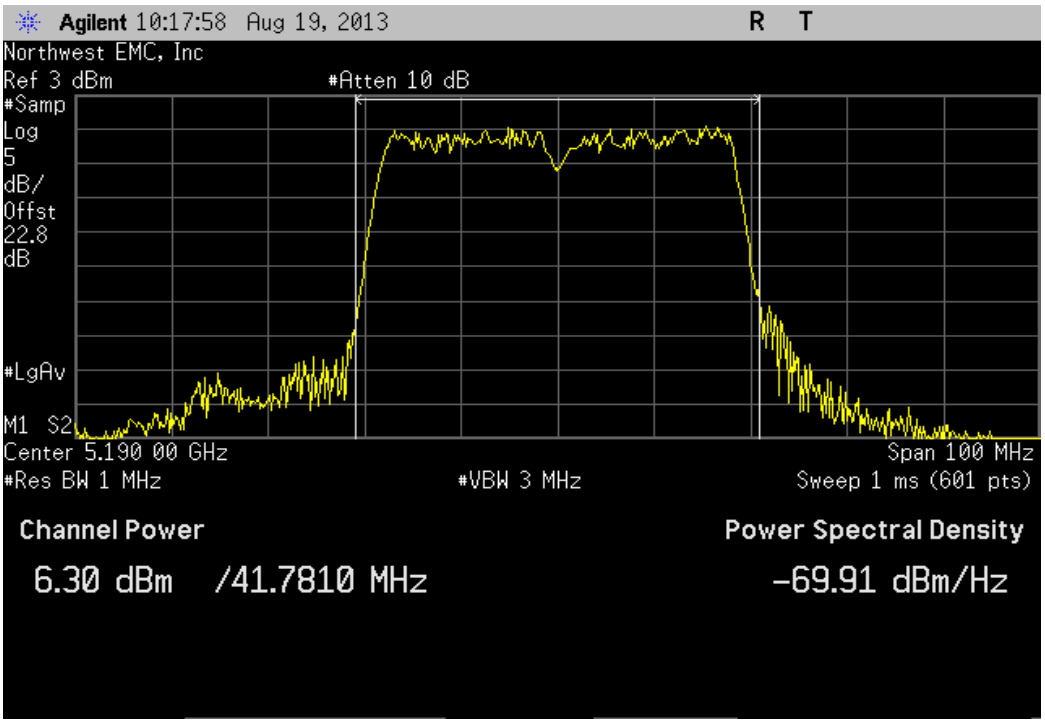
				Value	Limit	
				10.204 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

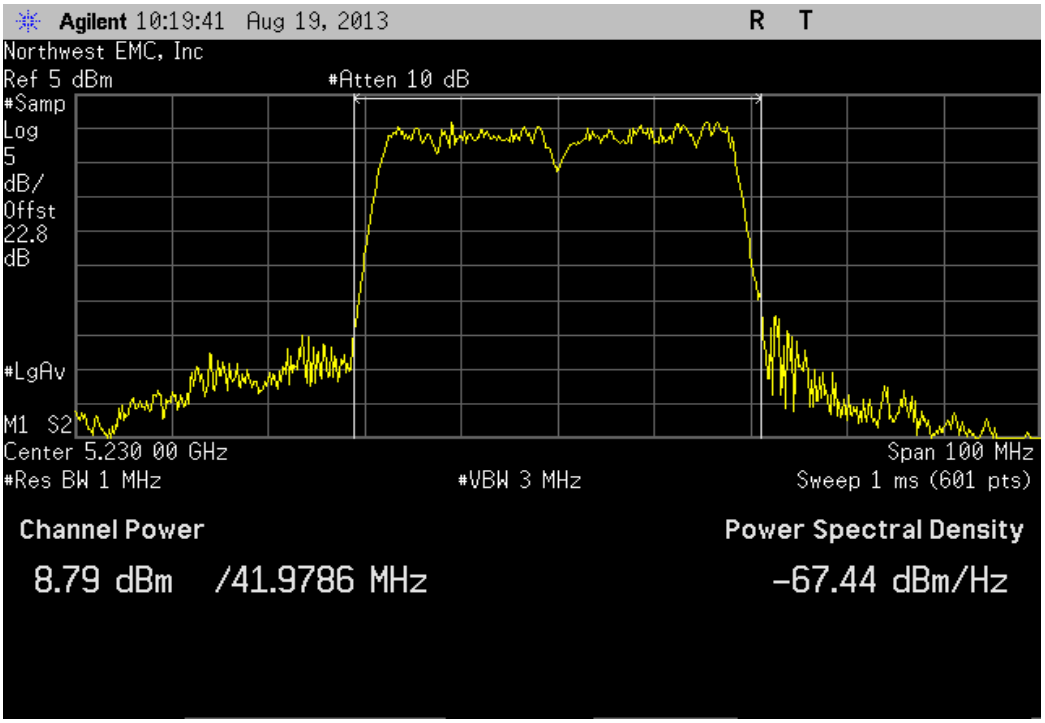
Chain A, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	
				6.298 dBm	< 17 dBm	Pass



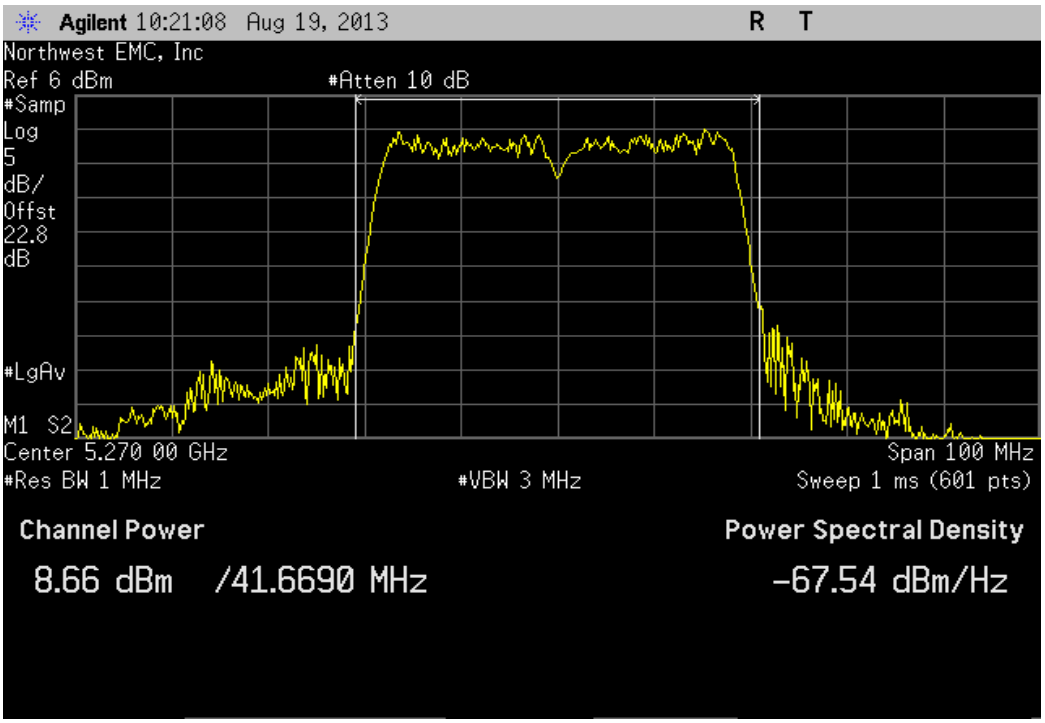
Chain A, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

				Value	Limit	
				8.791 dBm	< 17 dBm	Pass

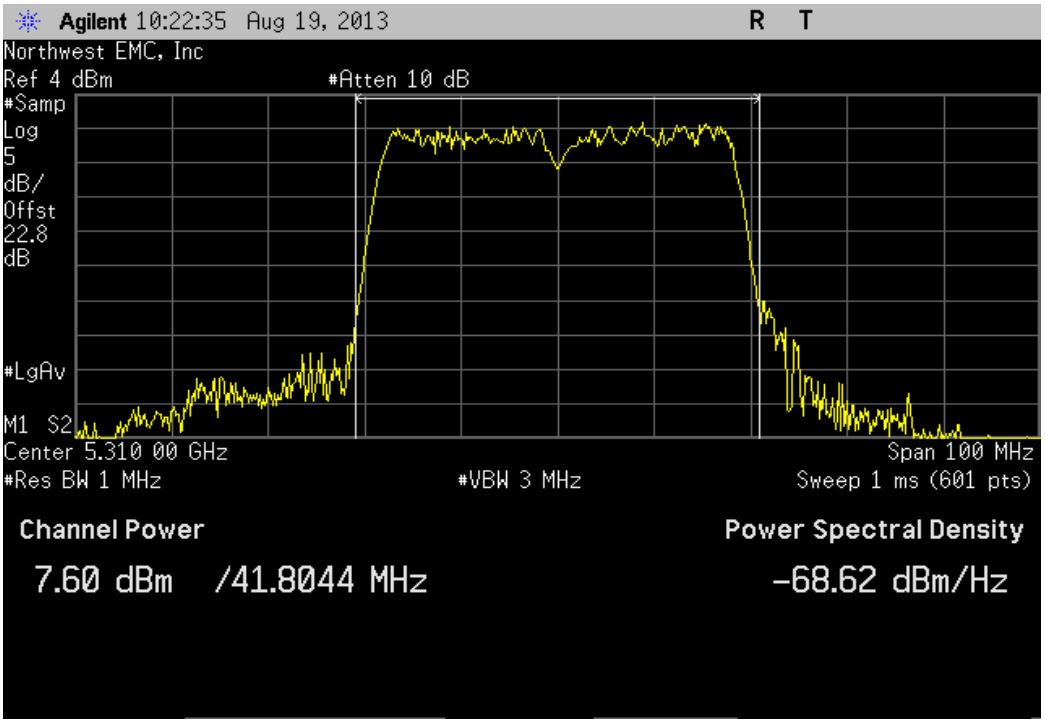


Peak Transmit Power - Antenna A-B

Chain A, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	
				8.659 dBm	< 24 dBm	Pass



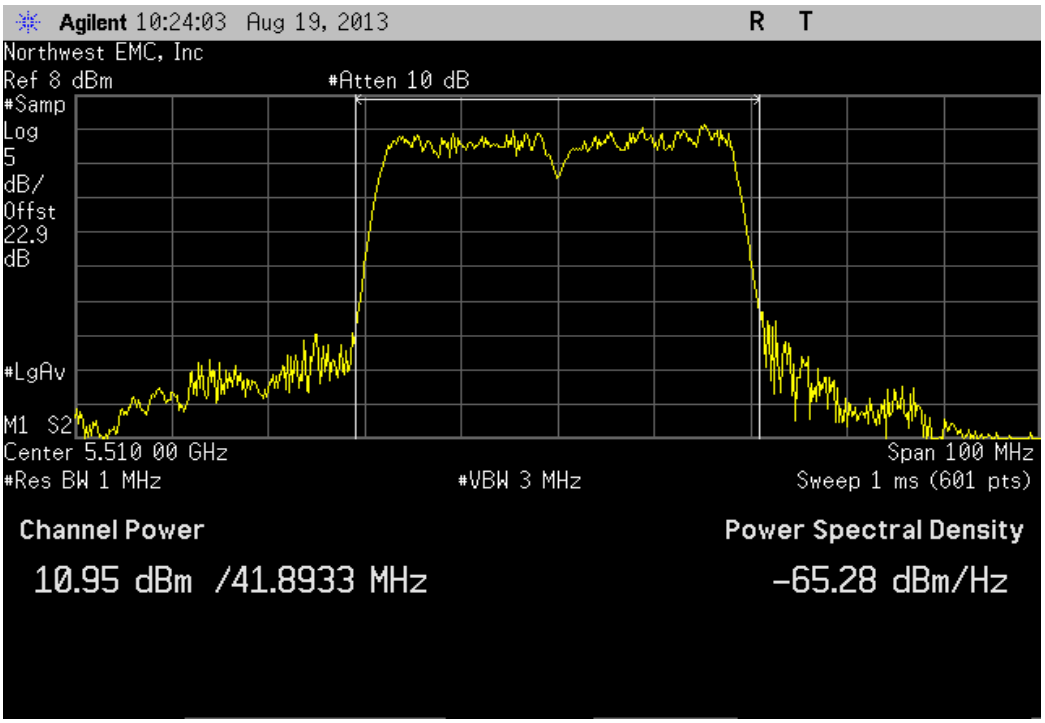
Chain A, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	
				7.597 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

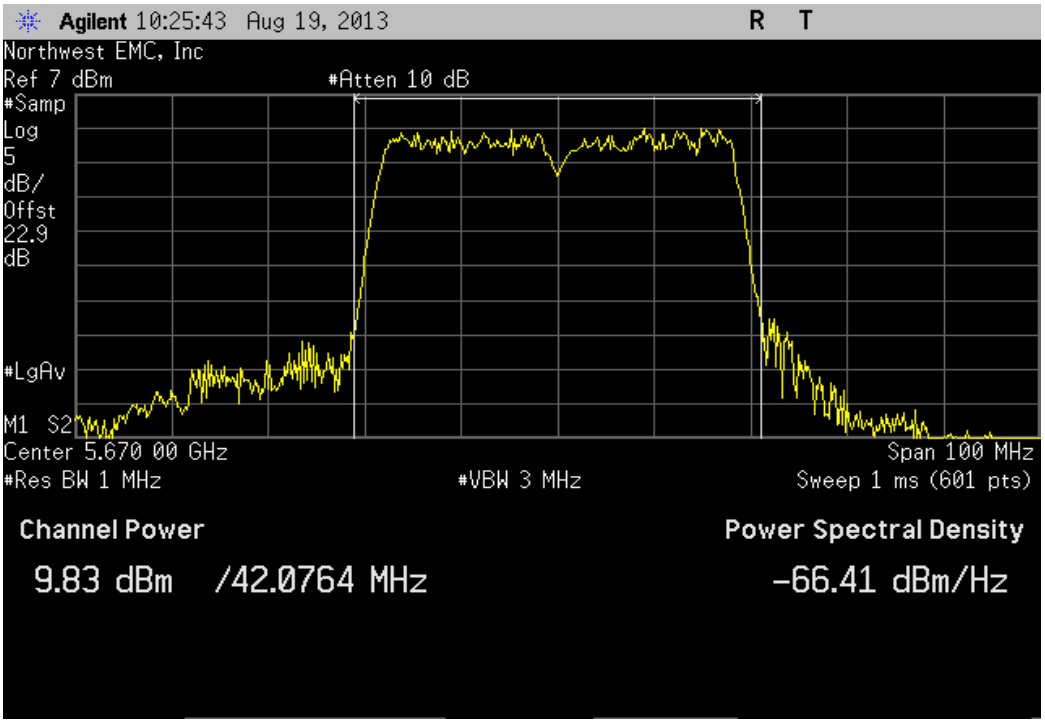
Chain A, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	
				10.946 dBm	< 24 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

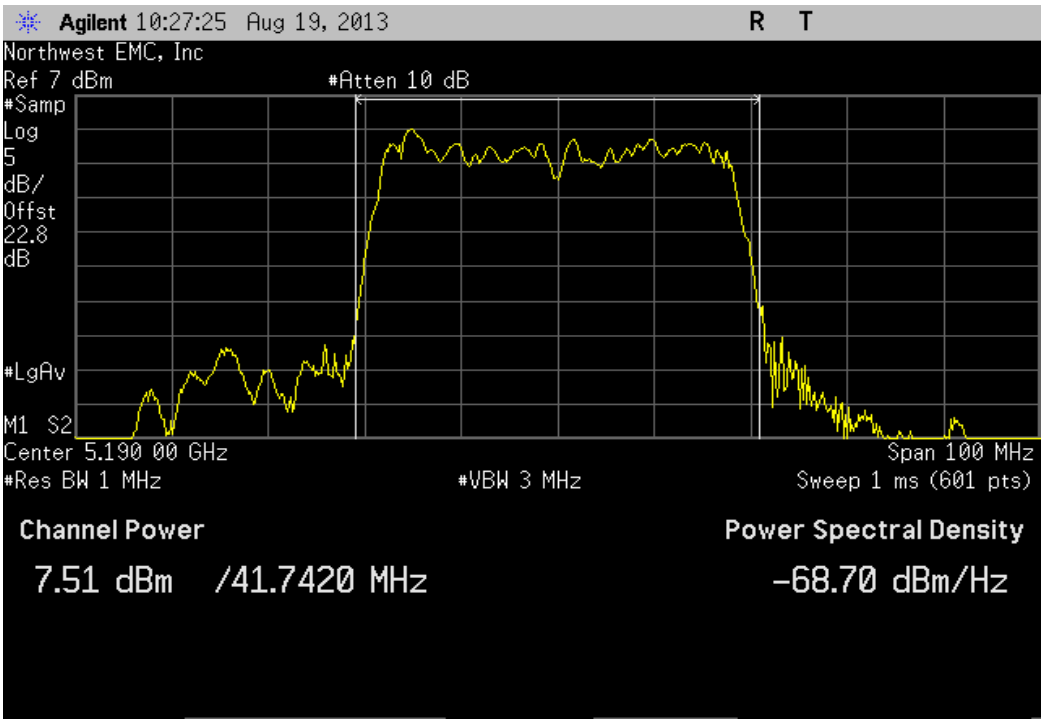
				Value	Limit	
				9.831 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

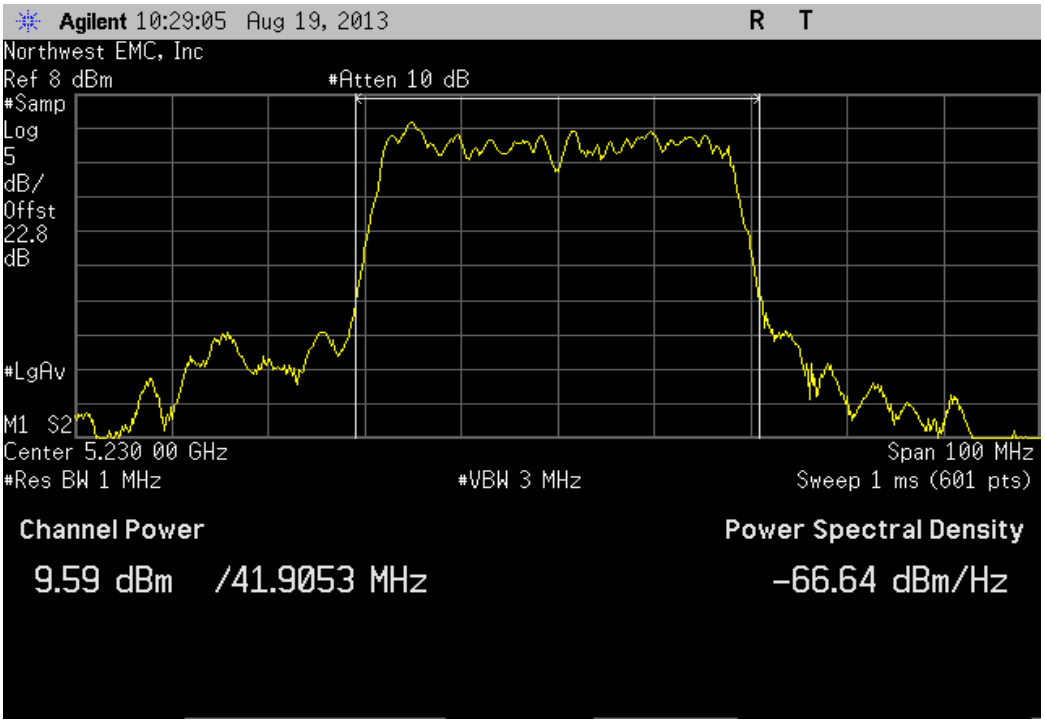
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	
				7.505 dBm	< 17 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

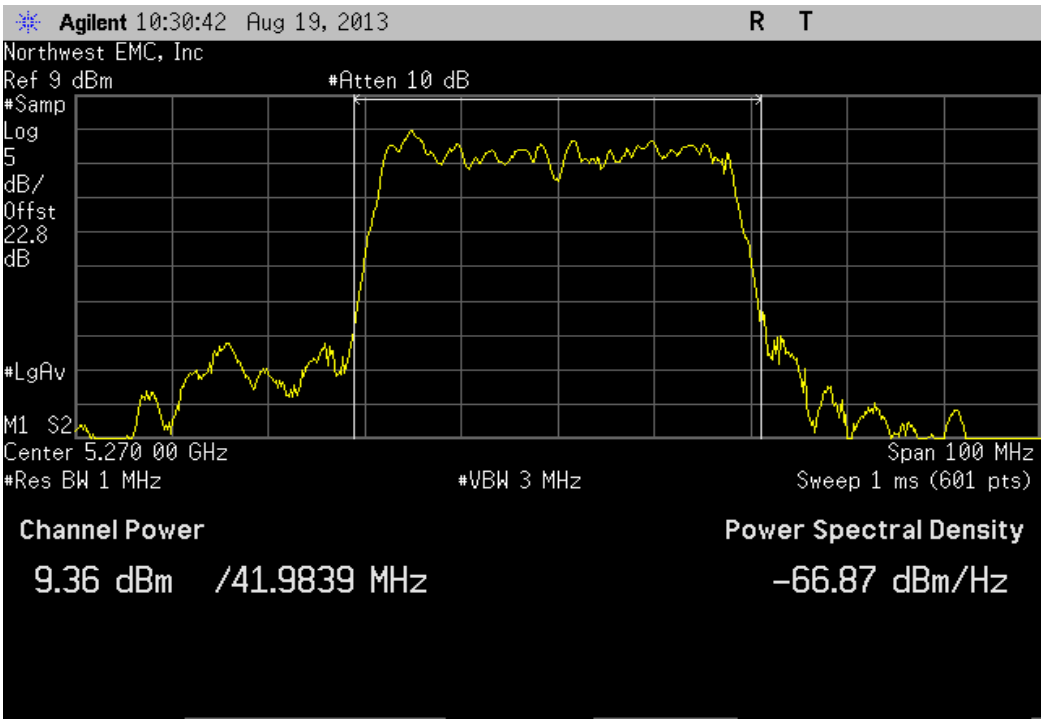
				Value	Limit	
				9.587 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A-B

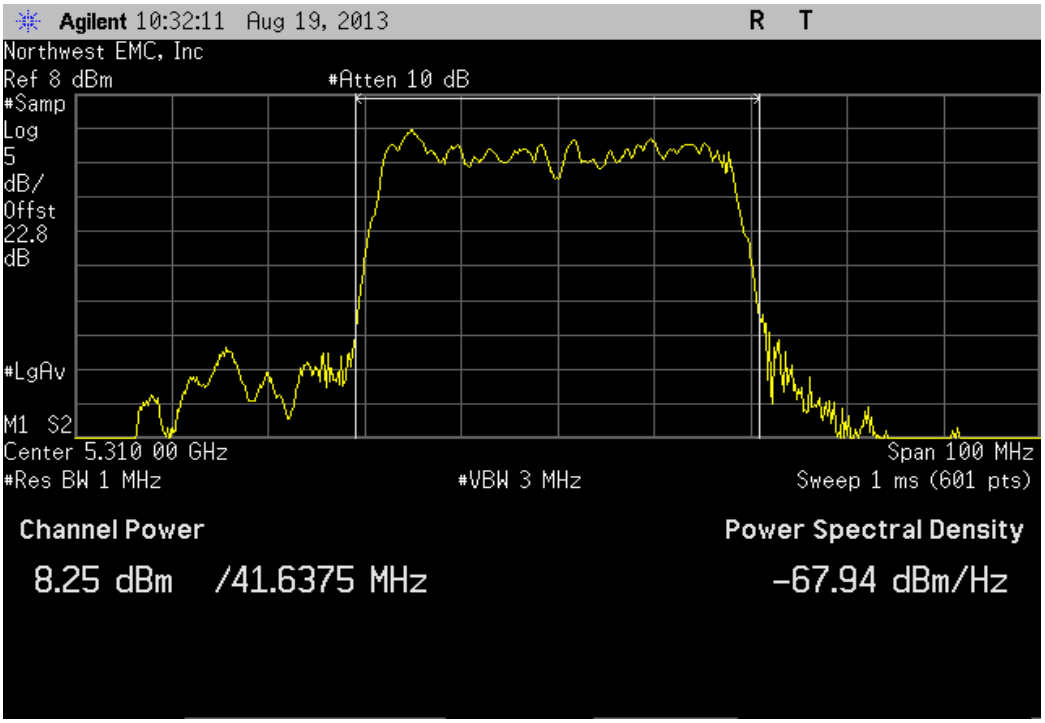
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	
				9.357 dBm	< 24 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

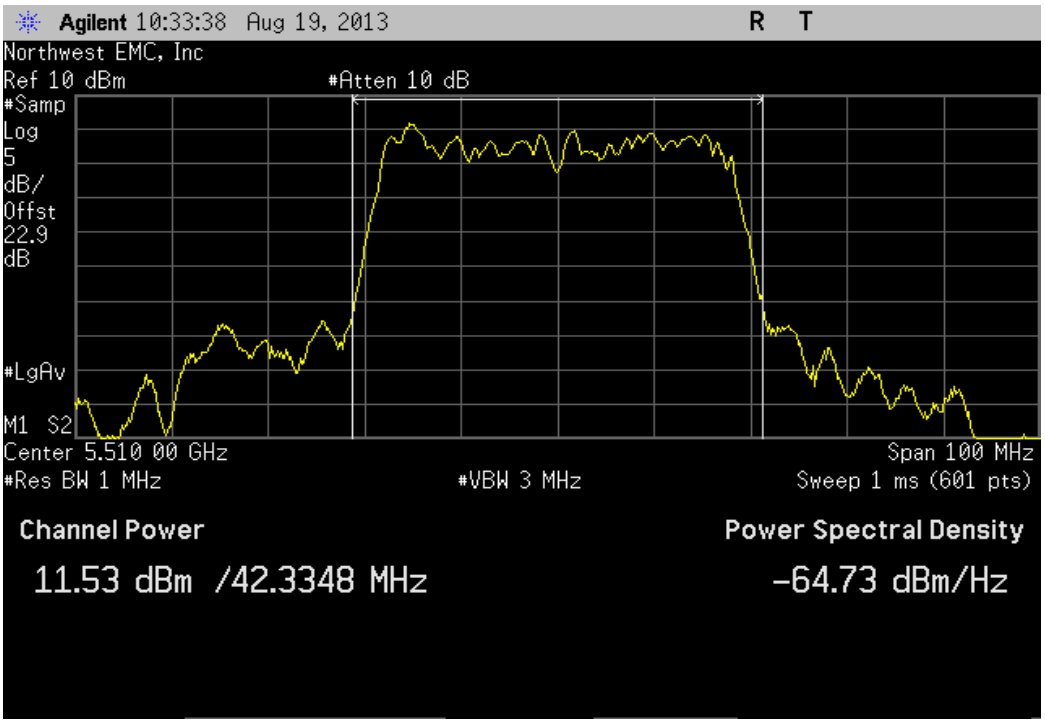
				Value	Limit	
				8.254 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

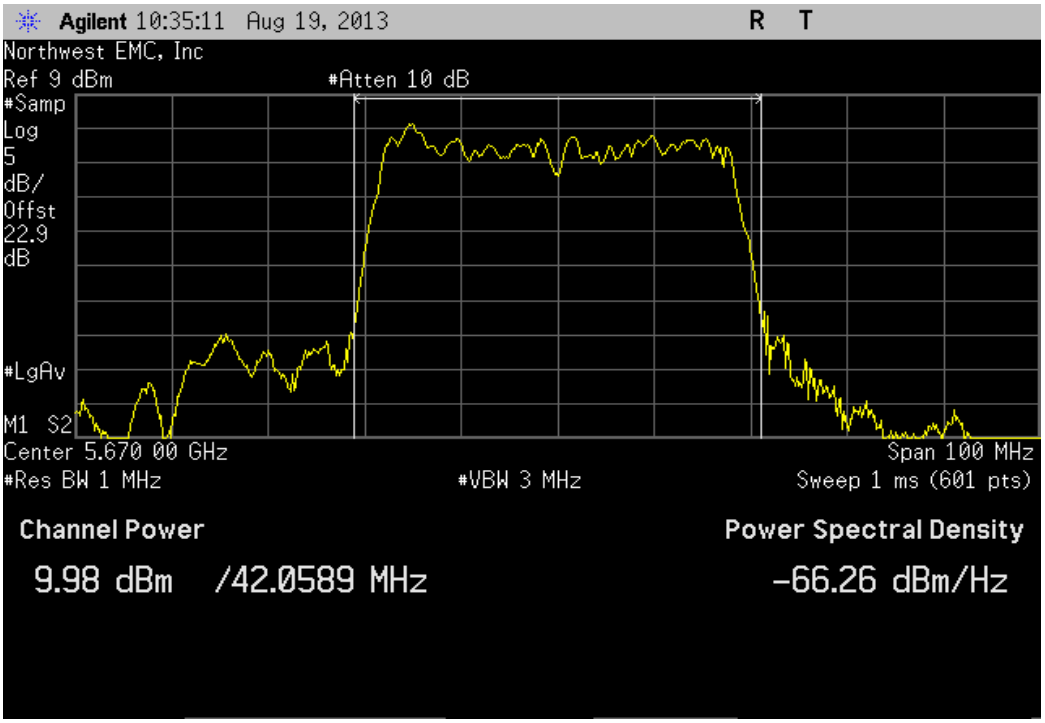
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	
				11.532 dBm	< 24 dBm	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

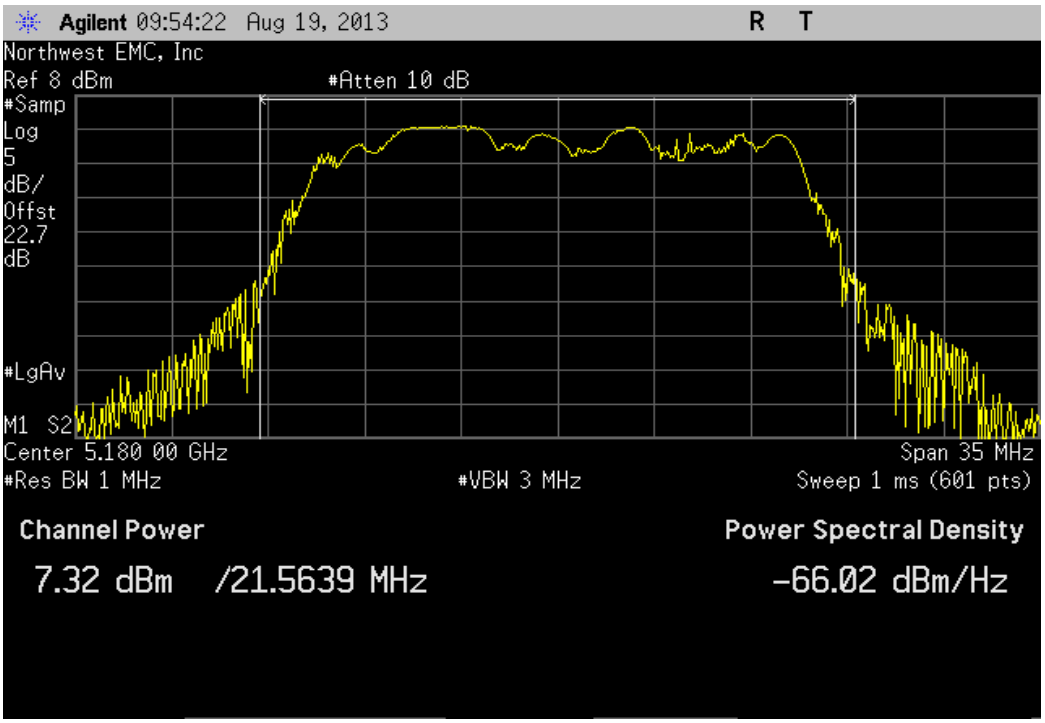
				Value	Limit	
				9.983 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

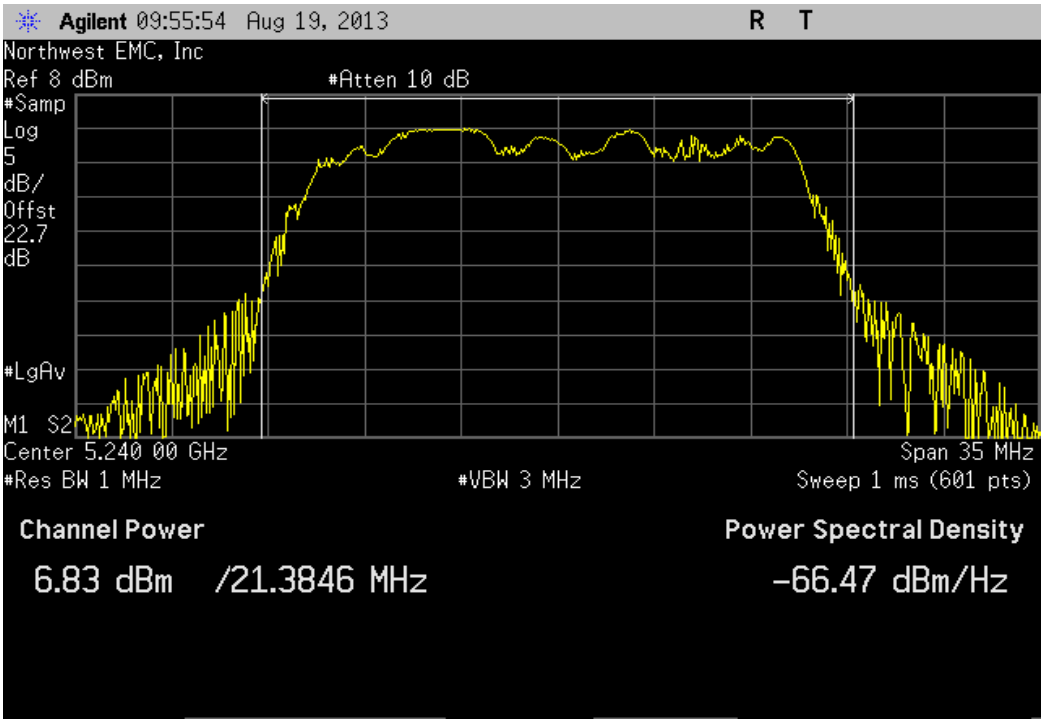
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	
				7.319 dBm	< 17 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

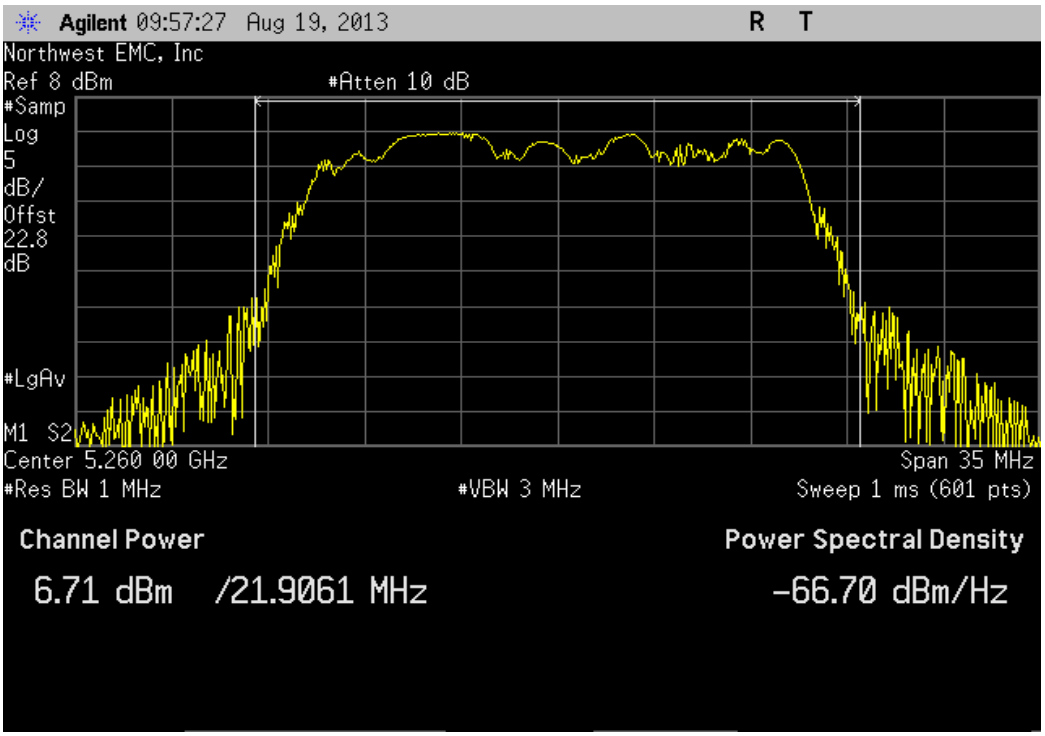
				Value	Limit	
				6.831 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A-B

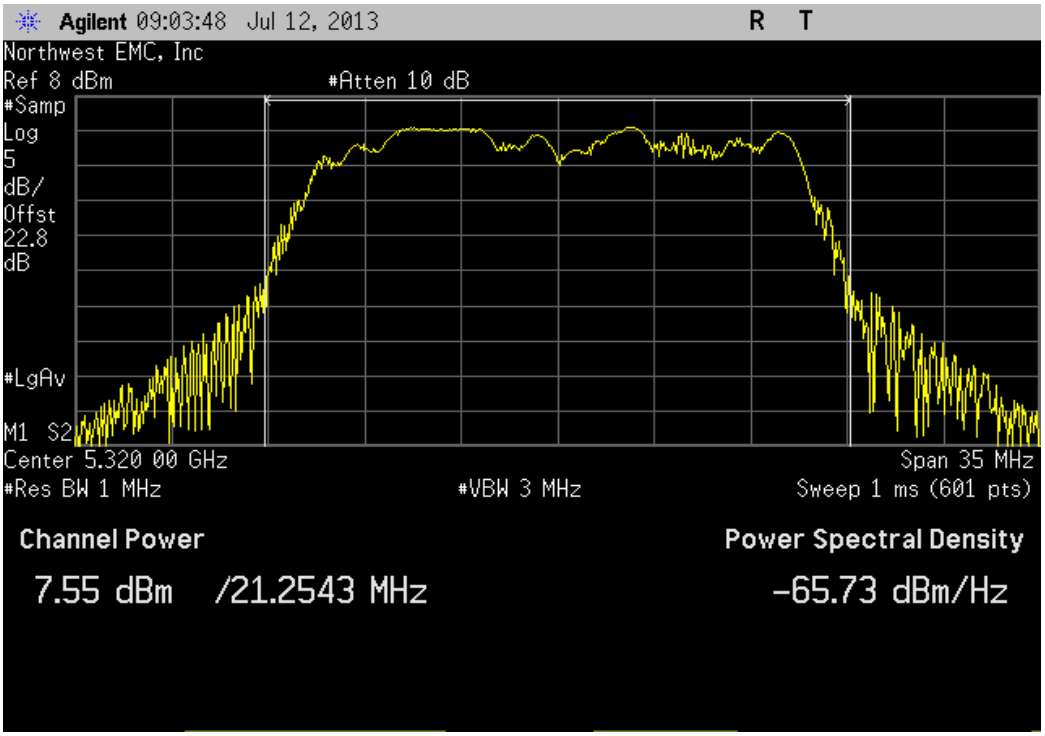
Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	
				6.706 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

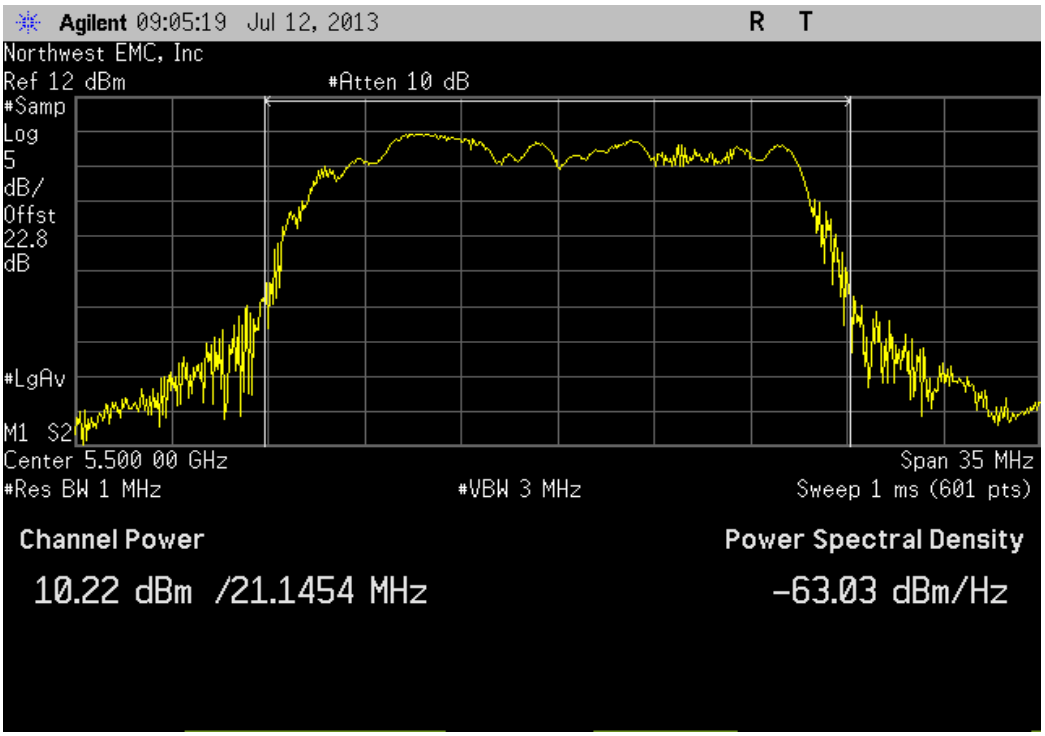
				Value	Limit	
				7.546 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

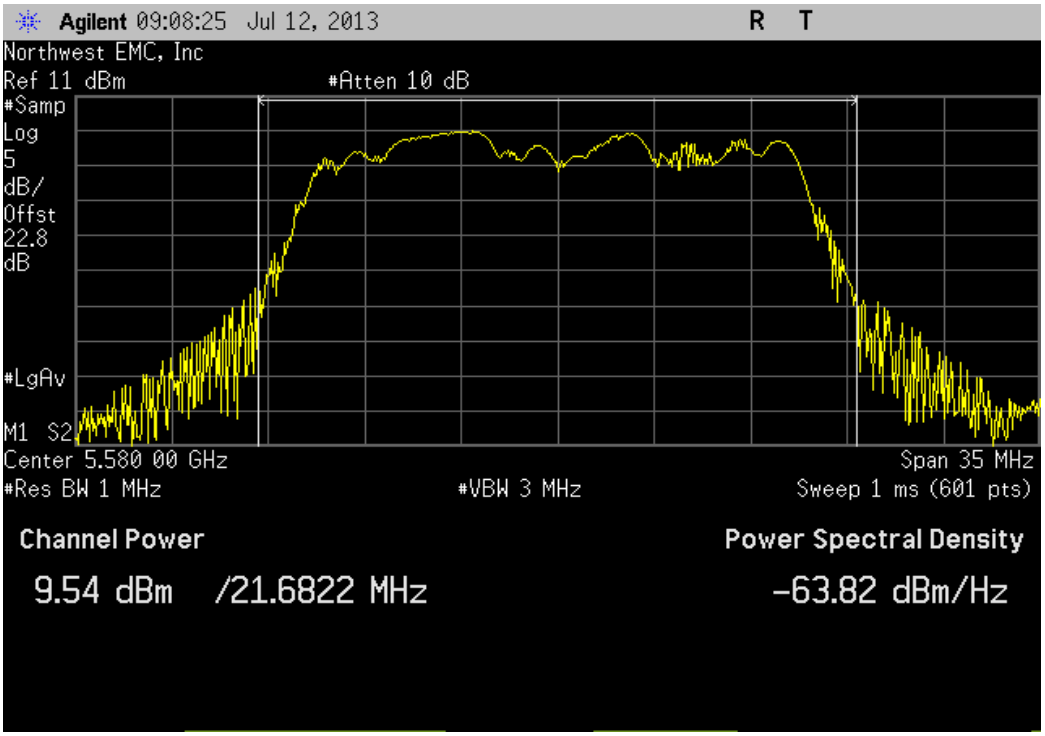
Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	
				10.218 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

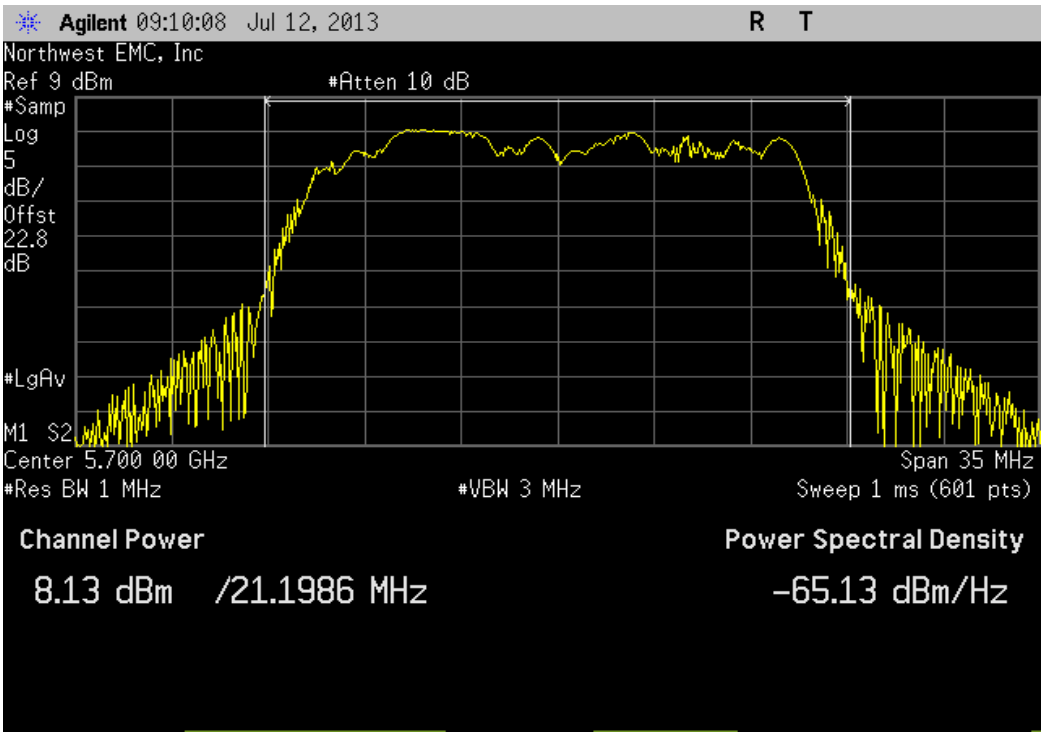
				Value	Limit	
				9.544 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

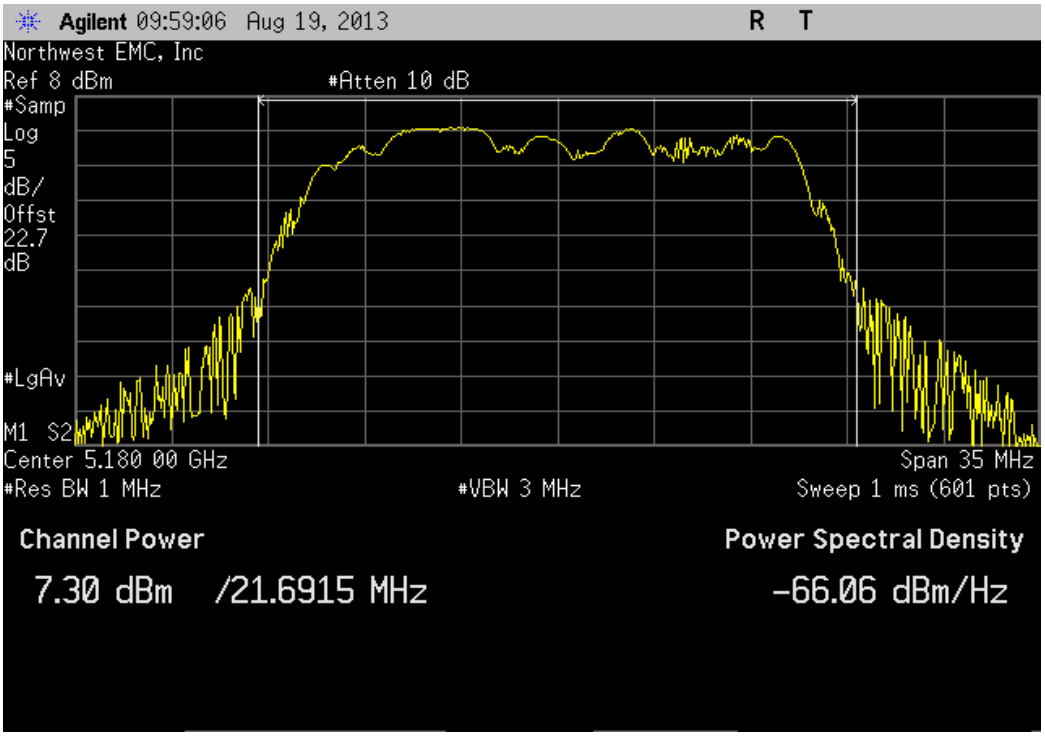
Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	
				8.132 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

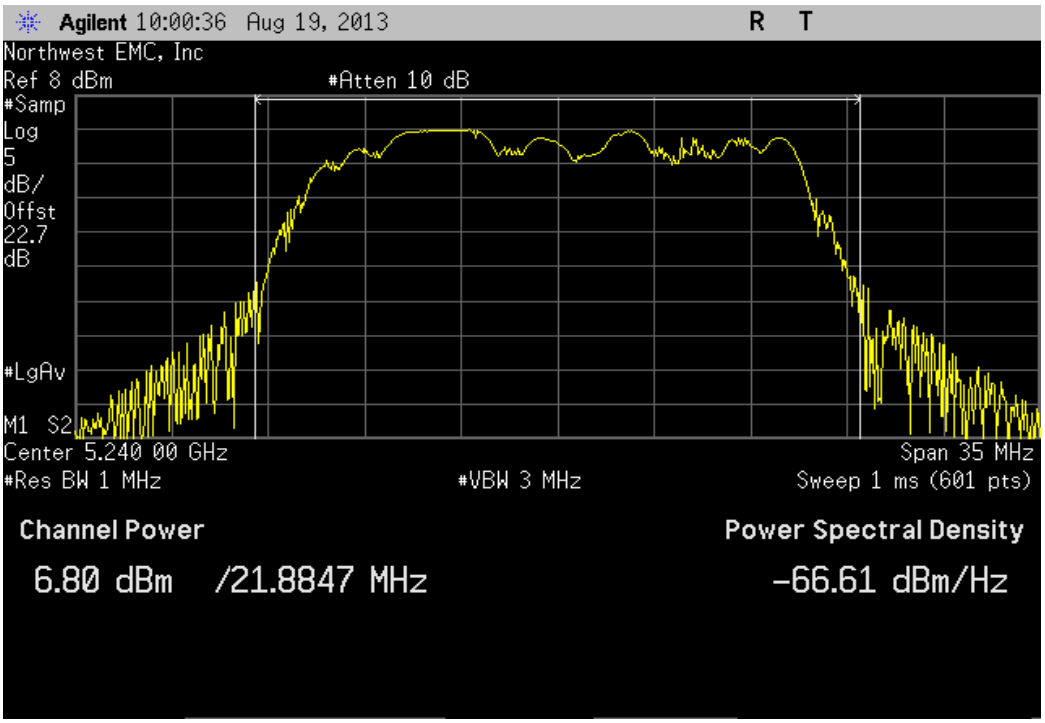
				Value	Limit	
				7.302 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A-B

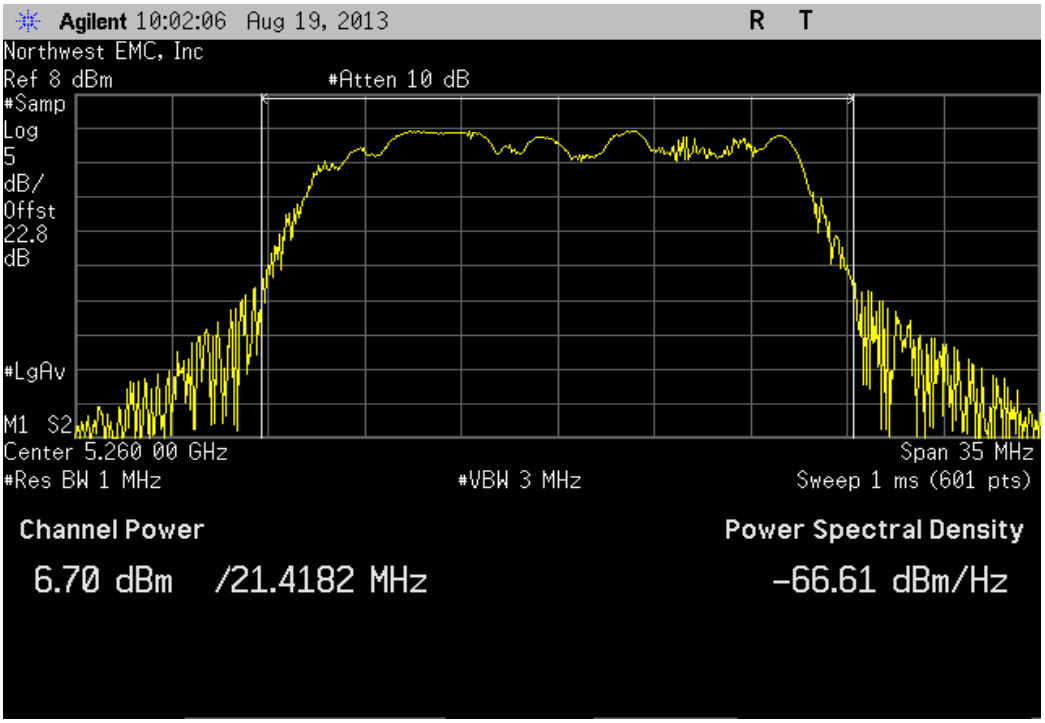
Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	
				6.795 dBm	< 17 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

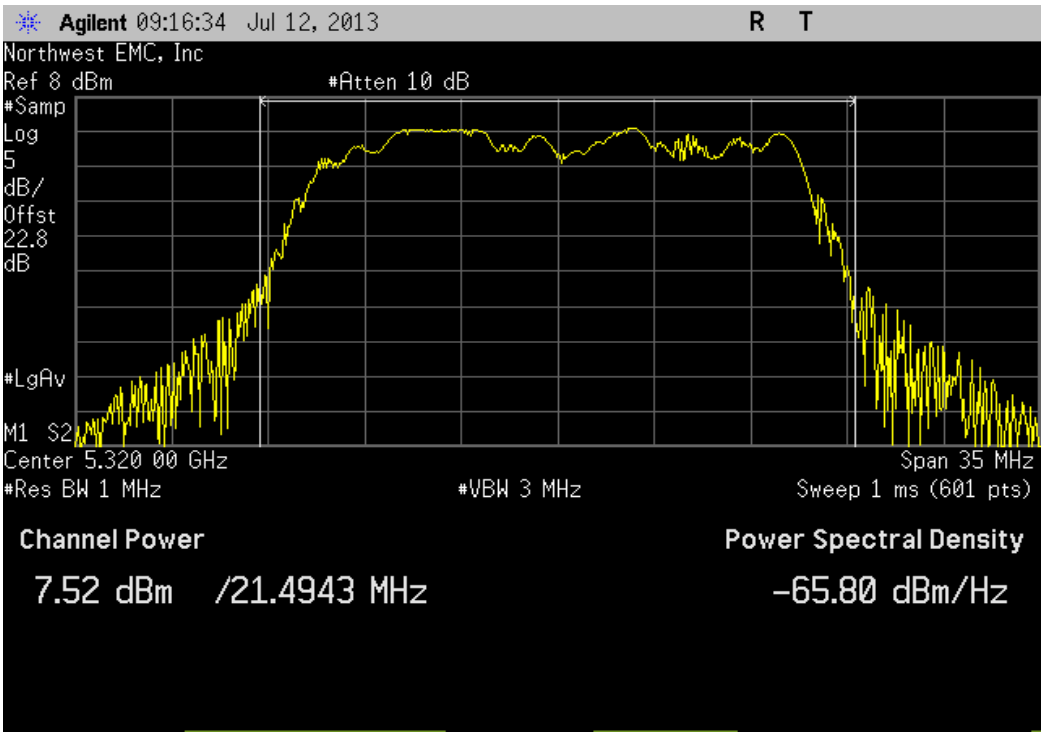
				Value	Limit	
				6.697 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

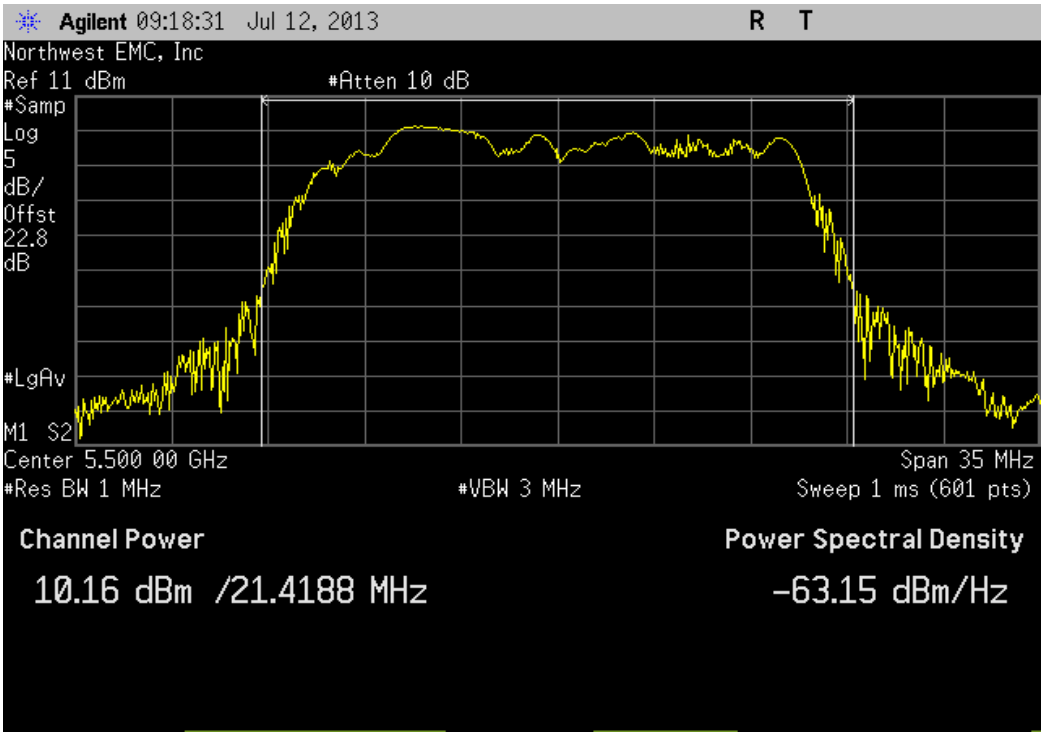
Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz

				Value	Limit	
				7.519 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz

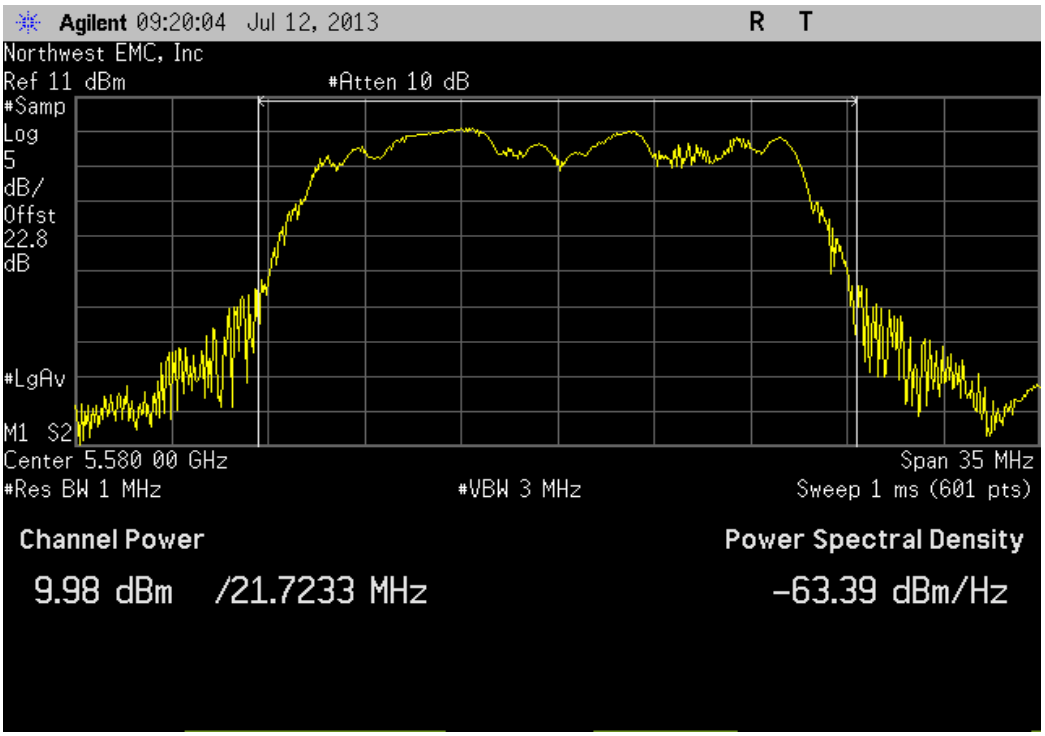
				Value	Limit	
				10.163 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

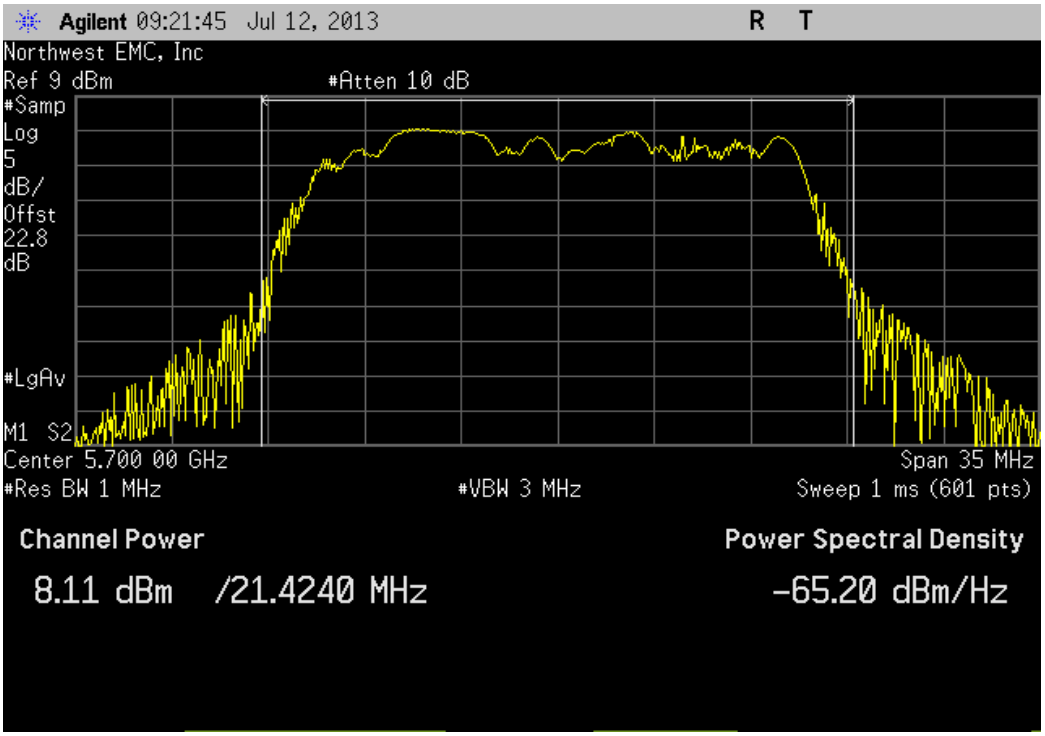
Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	
				9.98 dBm	< 24 dBm	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

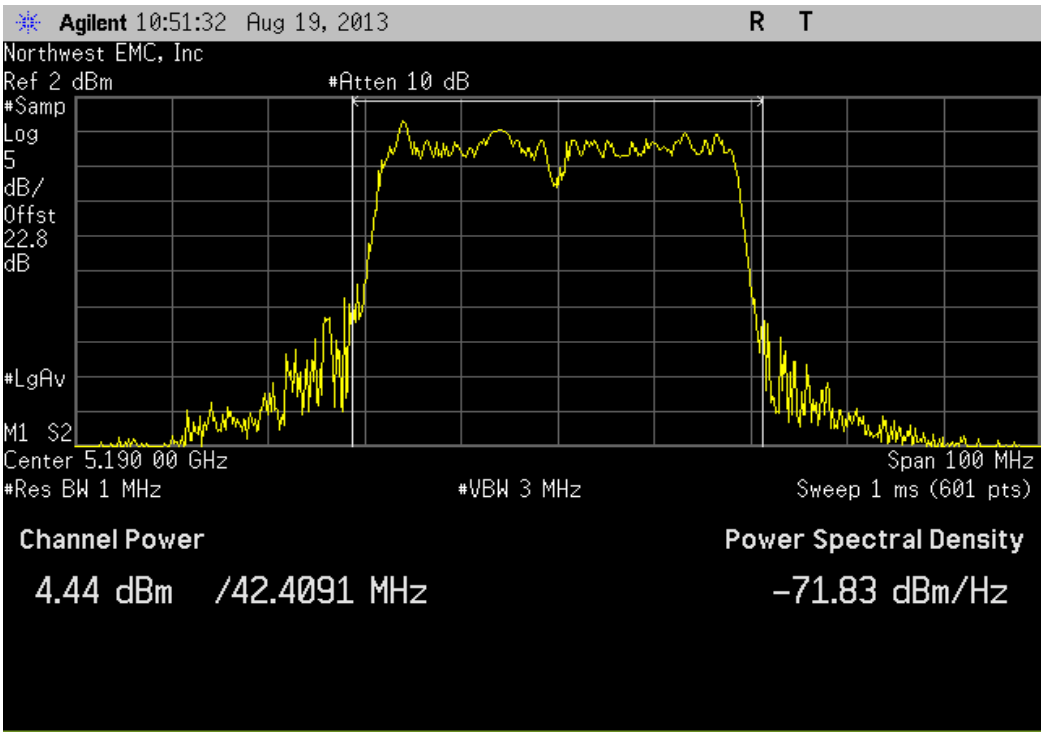
				Value	Limit	
				8.11 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

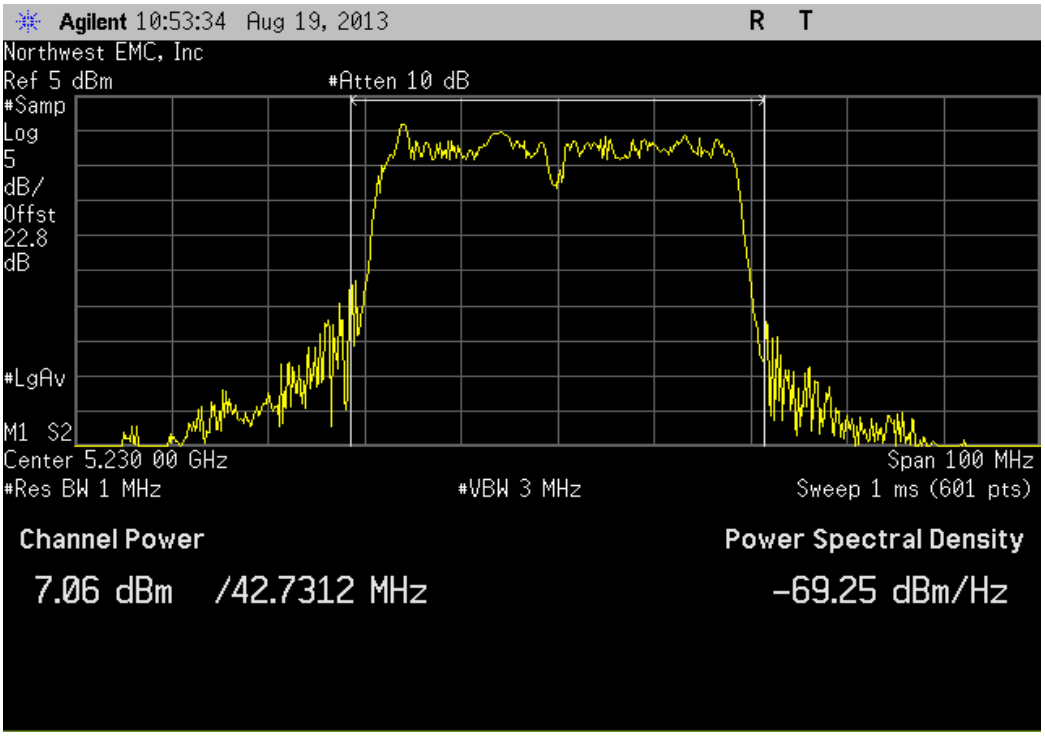
Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	
				4.441 dBm	< 17 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

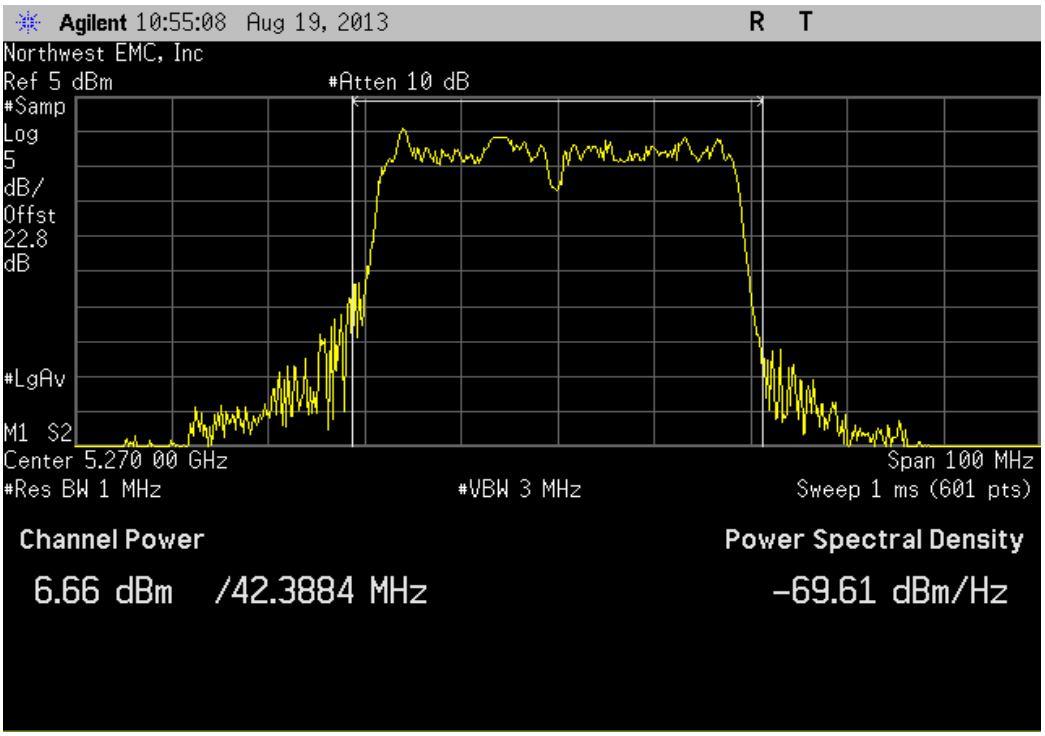
				Value	Limit	
				7.056 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A-B

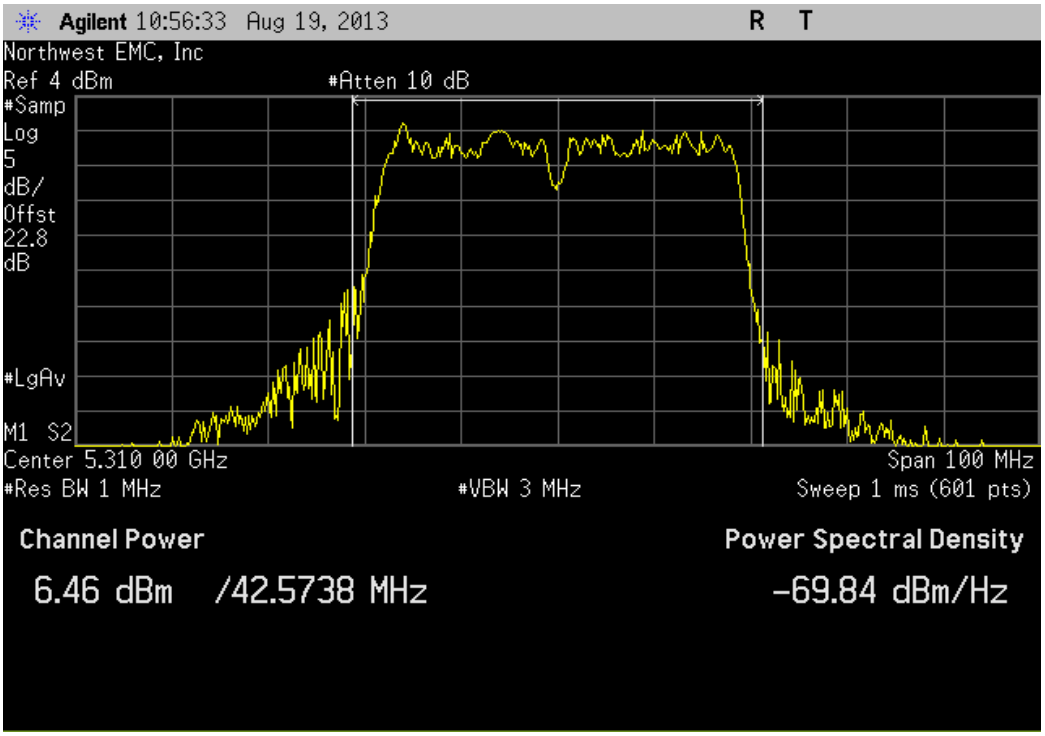
Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	
				6.663 dBm	< 24 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

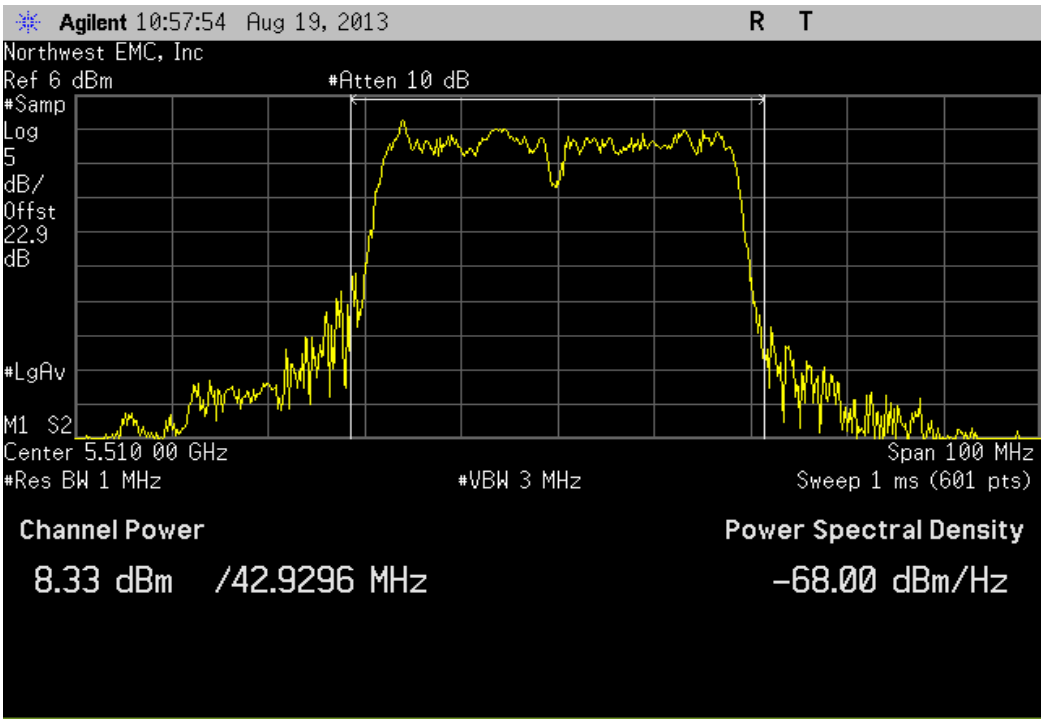
				Value	Limit	
				6.456 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

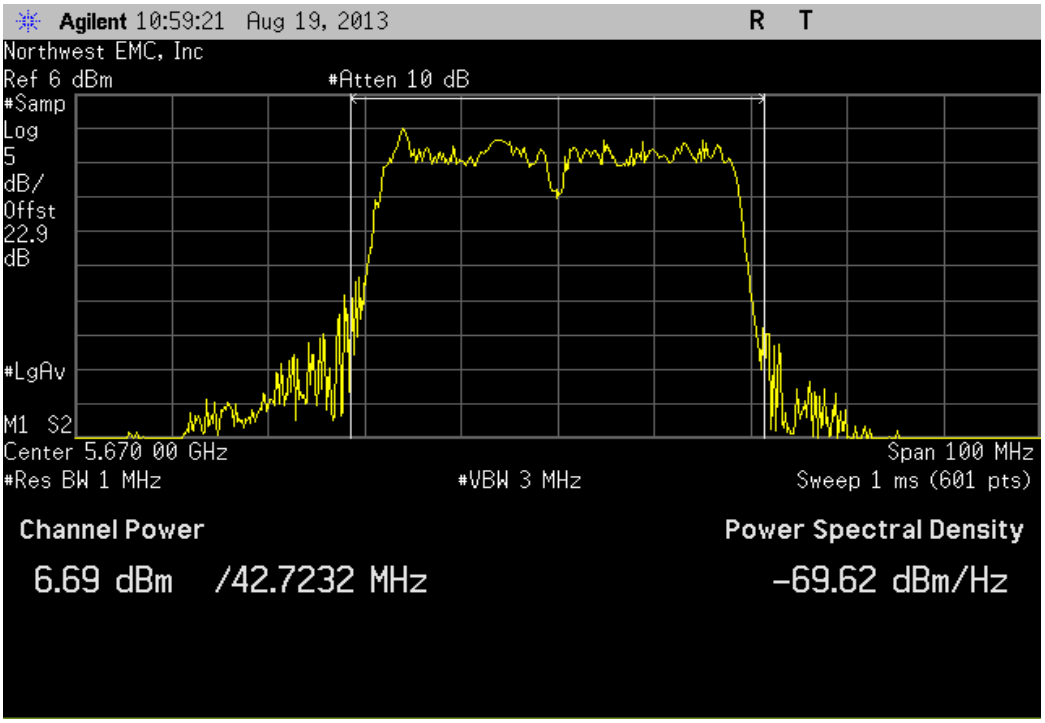
Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	
				8.328 dBm	< 24 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

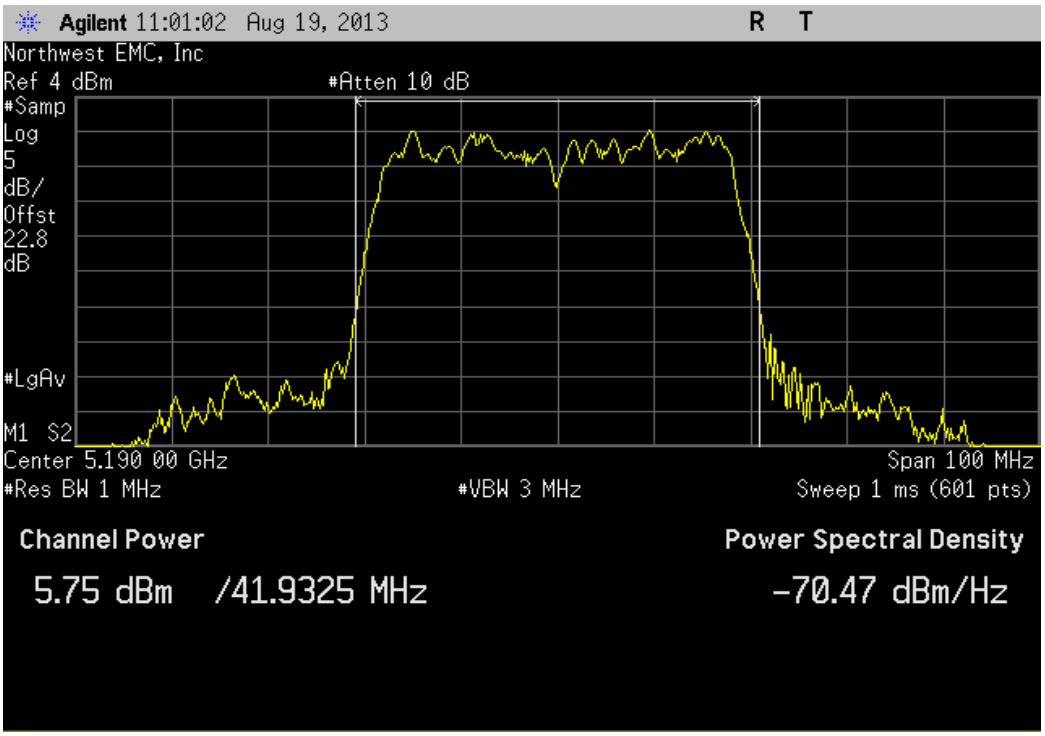
				Value	Limit	
				6.69 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

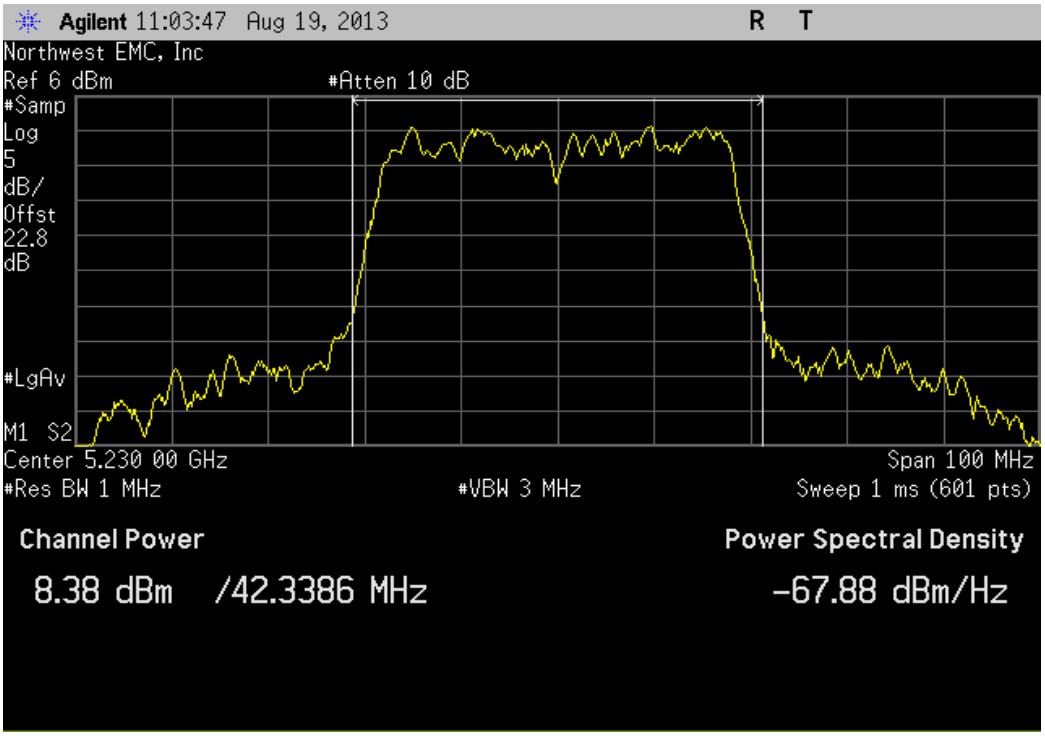
Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	
				5.755 dBm	< 17 dBm	Pass



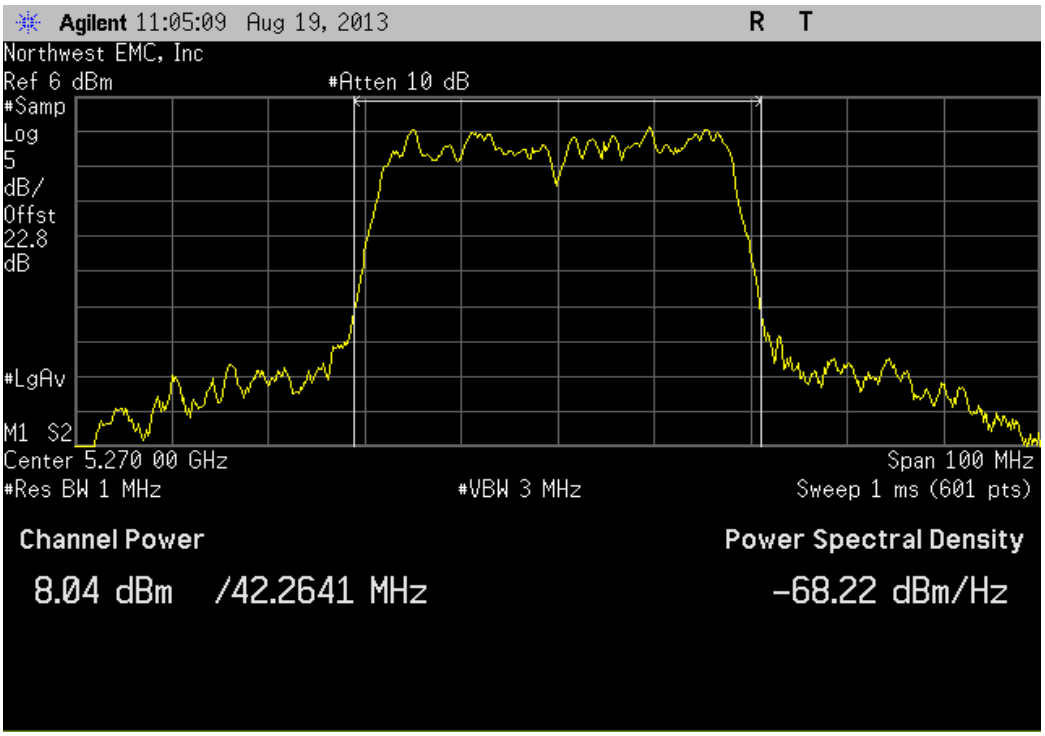
Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

				Value	Limit	
				8.385 dBm	< 17 dBm	Pass

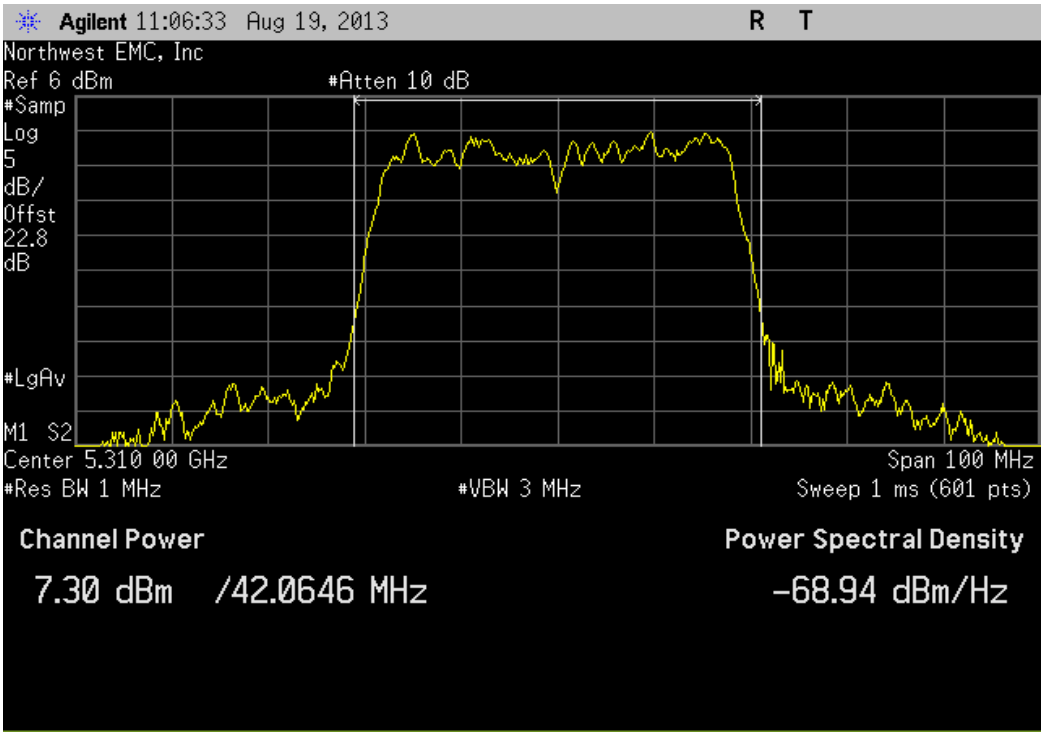


Peak Transmit Power - Antenna A-B

Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	
				8.045 dBm	< 24 dBm	Pass



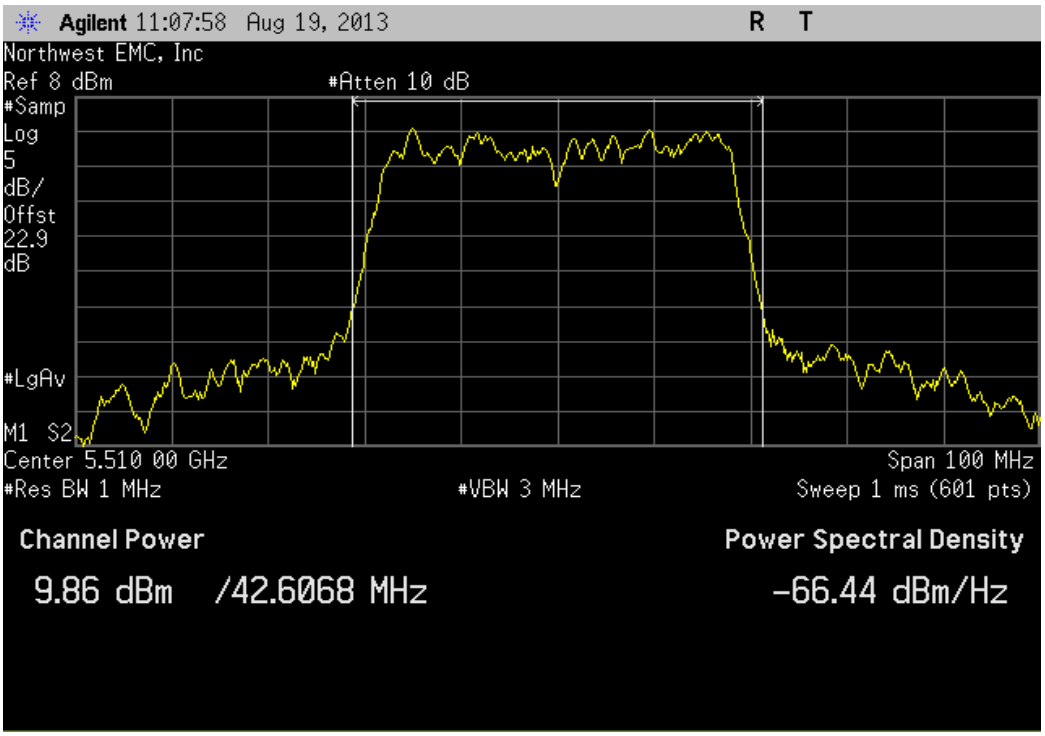
Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	
				7.297 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A-B

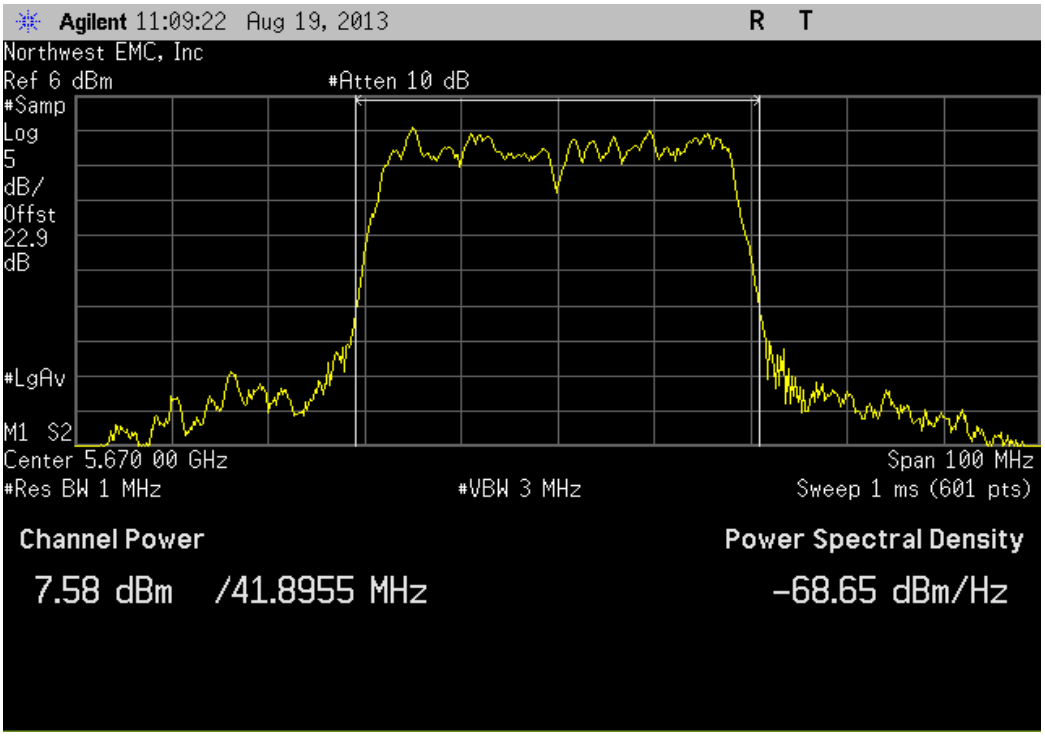
Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	
				9.859 dBm	< 24 dBm	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	
				7.576 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Peak Transmit Power - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/13/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

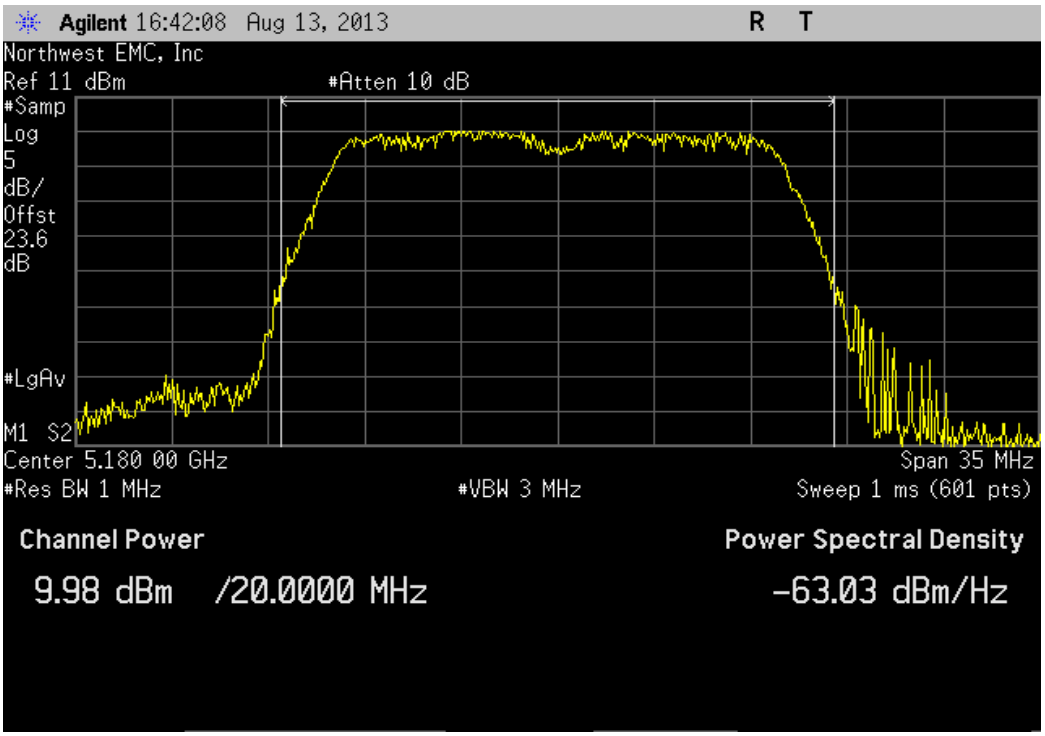
Configuration #	1	Signature

			Value	Limit	Result
20 MHz					
	802.11(a) 6 Mbps				
		Ch 36, Low Channel 5180 MHz	9.977 dBm	< 17 dBm	Pass
		Ch 48, High Channel 5240 MHz	9.733 dBm	< 17 dBm	Pass
		Ch 52, Low Channel 5260 MHz	9.265 dBm	< 24 dBm	Pass
		Ch 64, High Channel 5320 MHz	9.959 dBm	< 24 dBm	Pass
		Ch 100, Low Channel 5500 MHz	13.452 dBm	< 24 dBm	Pass
		Ch 116, Mid Channel 5580 MHz	12.785 dBm	< 24 dBm	Pass
		Ch 140, High Channel 5700 MHz	11.543 dBm	< 24 dBm	Pass
	802.11(a) 36 Mbps				
		Ch 36, Low Channel 5180 MHz	9.946 dBm	< 17 dBm	Pass
		Ch 48, High Channel 5240 MHz	9.709 dBm	< 17 dBm	Pass
		Ch 52, Low Channel 5260 MHz	9.214 dBm	< 24 dBm	Pass
		Ch 64, High Channel 5320 MHz	9.85 dBm	< 24 dBm	Pass
		Ch 100, Low Channel 5500 MHz	13.332 dBm	< 24 dBm	Pass
		Ch 116, Mid Channel 5580 MHz	12.712 dBm	< 24 dBm	Pass
		Ch 140, High Channel 5700 MHz	11.457 dBm	< 24 dBm	Pass
	802.11(a) 54 Mbps				
		Ch 36, Low Channel 5180 MHz	9.849 dBm	< 17 dBm	Pass
		Ch 48, High Channel 5240 MHz	9.625 dBm	< 17 dBm	Pass
		Ch 52, Low Channel 5260 MHz	9.139 dBm	< 24 dBm	Pass
		Ch 64, High Channel 5320 MHz	9.739 dBm	< 24 dBm	Pass
		Ch 100, Low Channel 5500 MHz	13.229 dBm	< 24 dBm	Pass
		Ch 116, Mid Channel 5580 MHz	12.552 dBm	< 24 dBm	Pass
		Ch 140, High Channel 5700 MHz	11.302 dBm	< 24 dBm	Pass
	802.11(n) MCS0				
		Ch 36, Low Channel 5180 MHz	9.81 dBm	< 17 dBm	Pass
		Ch 48, High Channel 5240 MHz	9.576 dBm	< 17 dBm	Pass
		Ch 52, Low Channel 5260 MHz	9.102 dBm	< 24 dBm	Pass
		Ch 64, High Channel 5320 MHz	9.713 dBm	< 24 dBm	Pass
		Ch 100, Low Channel 5500 MHz	13.207 dBm	< 24 dBm	Pass
		Ch 116, Mid Channel 5580 MHz	12.532 dBm	< 24 dBm	Pass
		Ch 140, High Channel 5700 MHz	11.275 dBm	< 24 dBm	Pass
	802.11(n) MCS7				
		Ch 36, Low Channel 5180 MHz	9.805 dBm	< 17 dBm	Pass
		Ch 48, High Channel 5240 MHz	9.584 dBm	< 17 dBm	Pass
		Ch 52, Low Channel 5260 MHz	9.107 dBm	< 24 dBm	Pass
		Ch 64, High Channel 5320 MHz	9.706 dBm	< 24 dBm	Pass
		Ch 100, Low Channel 5500 MHz	13.209 dBm	< 24 dBm	Pass
		Ch 116, Mid Channel 5580 MHz	12.533 dBm	< 24 dBm	Pass
		Ch 140, High Channel 5700 MHz	11.267 dBm	< 24 dBm	Pass
40 MHz					
	802.11(n) MCS0				
		Ch 36/40, Low Channel 5190 MHz	7.872 dBm	< 17 dBm	Pass
		Ch 44/48, High Channel 5230 MHz	10.332 dBm	< 17 dBm	Pass
		Ch 52/56, Low Channel 5270 MHz	9.62 dBm	< 24 dBm	Pass
		Ch 60/64, High Channel 5310 MHz	8.559 dBm	< 24 dBm	Pass
		Ch 100/104, Low Channel 5510 MHz	11.61 dBm	< 24 dBm	Pass
		Ch 132/136, High Channel 5670 MHz	10.713 dBm	< 24 dBm	Pass
	802.11(n) MCS7				
		Ch 36/40, Low Channel 5190 MHz	9.074 dBm	< 17 dBm	Pass
		Ch 44/48, High Channel 5230 MHz	11.091 dBm	< 17 dBm	Pass
		Ch 52/56, Low Channel 5270 MHz	10.266 dBm	< 24 dBm	Pass
		Ch 60/64, High Channel 5310 MHz	9.307 dBm	< 24 dBm	Pass
		Ch 100/104, Low Channel 5510 MHz	12.33 dBm	< 24 dBm	Pass
		Ch 132/136, High Channel 5670 MHz	11.4 dBm	< 24 dBm	Pass

Peak Transmit Power - Antenna A

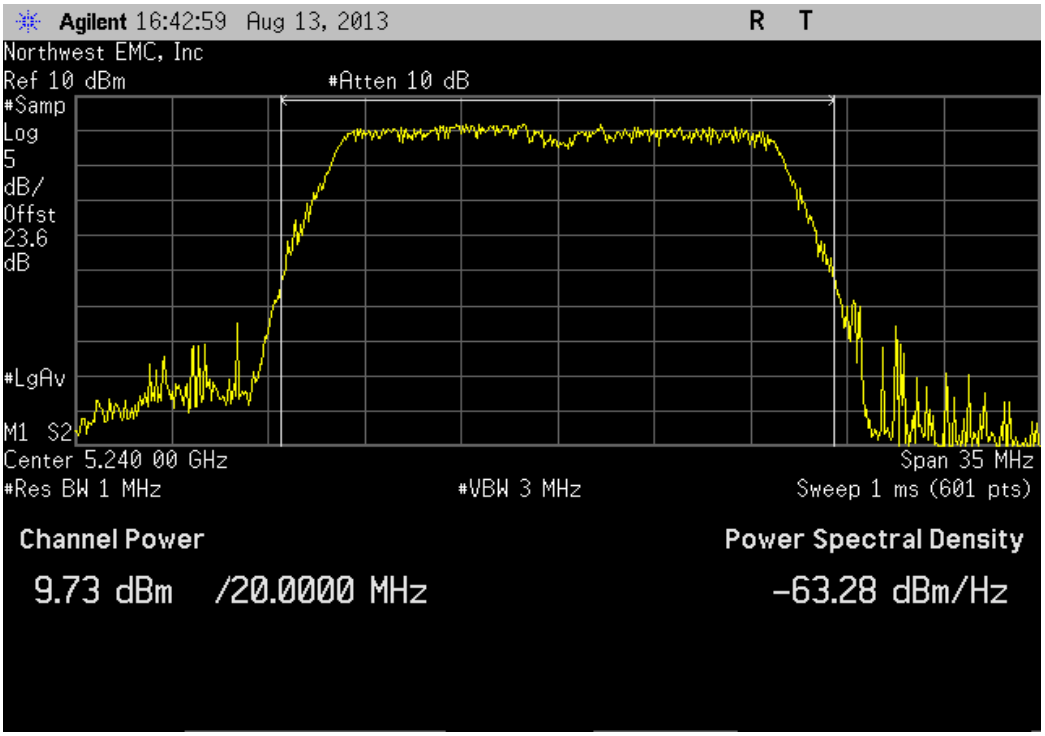
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				9.977 dBm	< 17 dBm	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

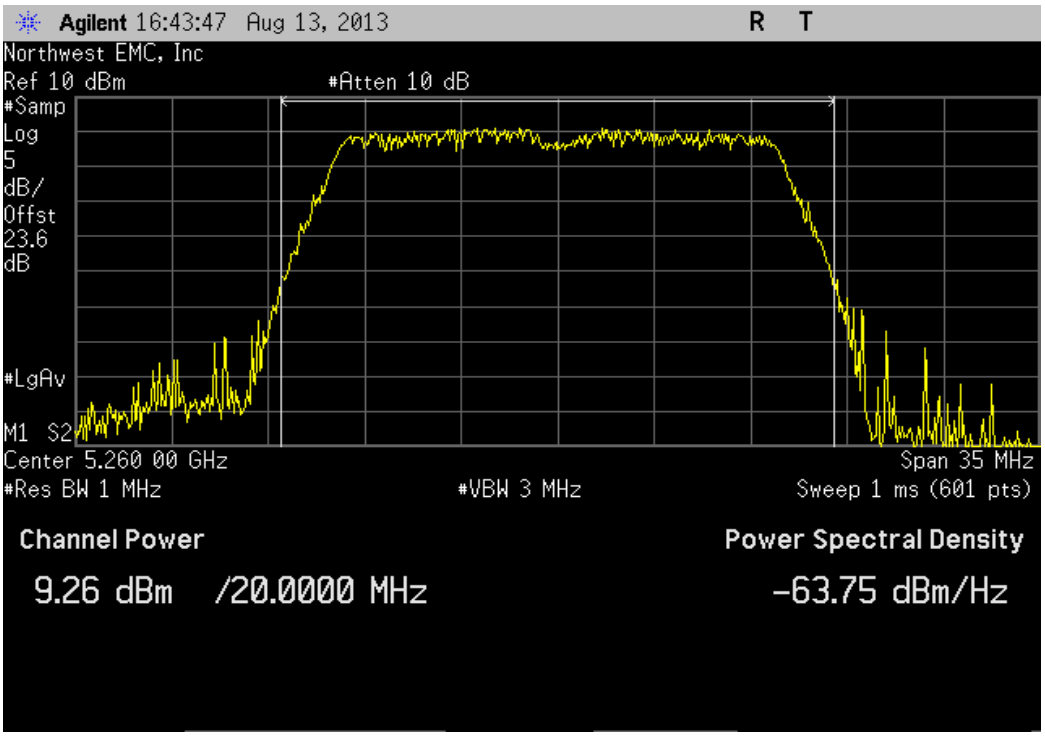
				Value	Limit	Result
				9.733 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

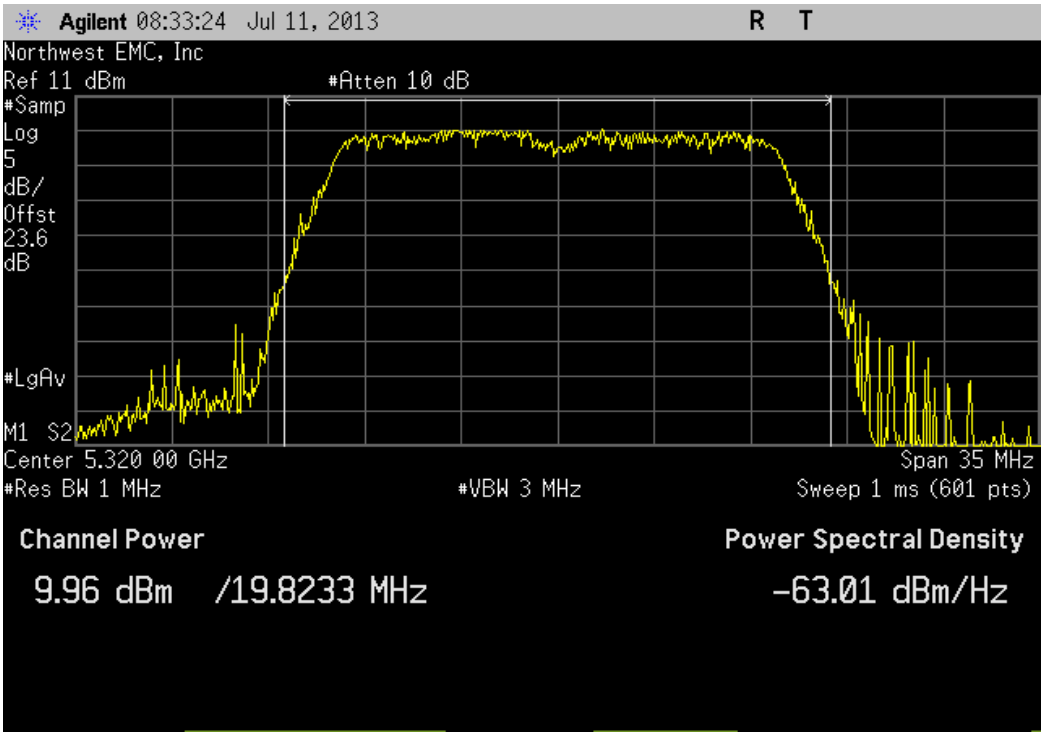
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				9.265 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

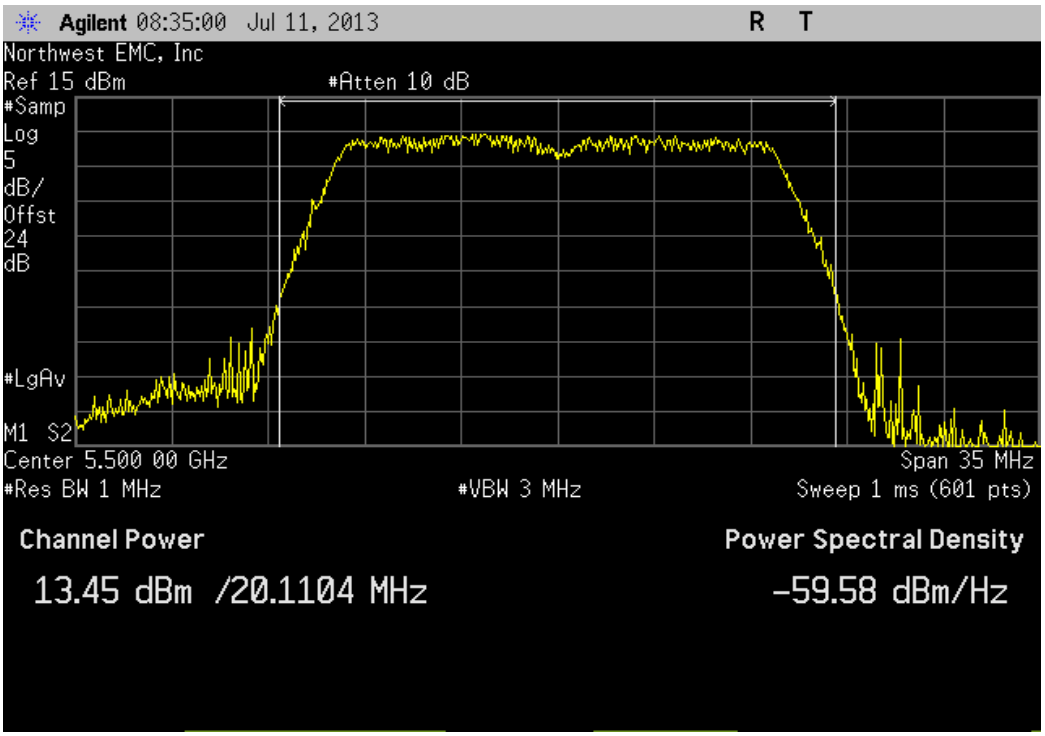
				Value	Limit	Result
				9.959 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

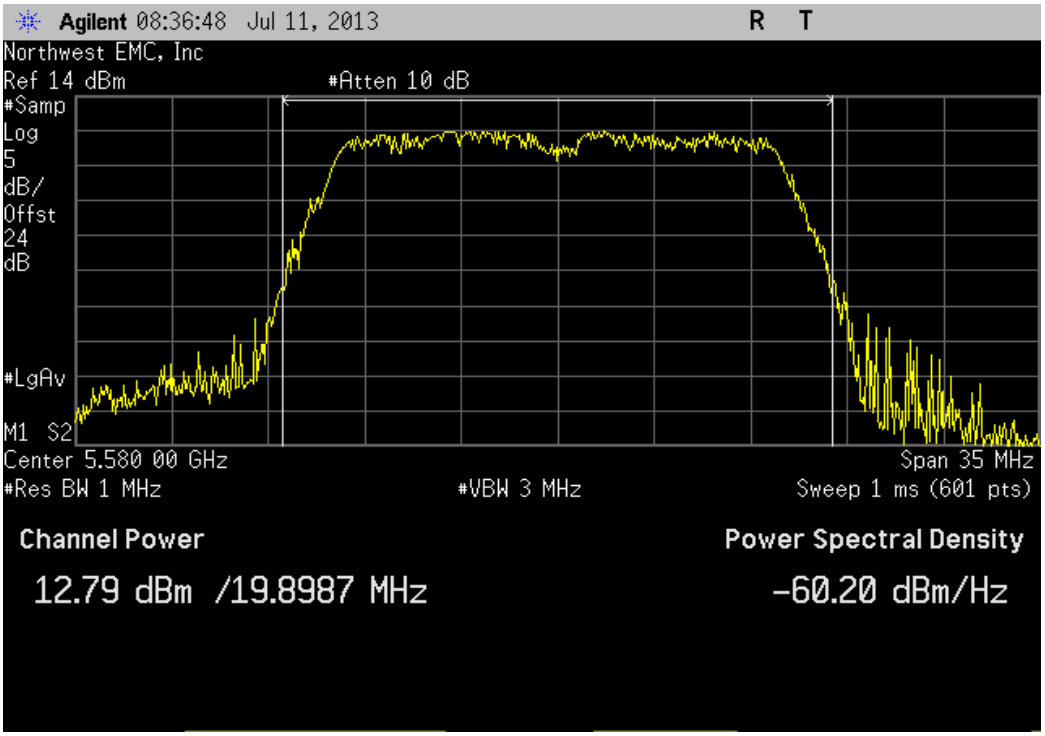
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				13.452 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

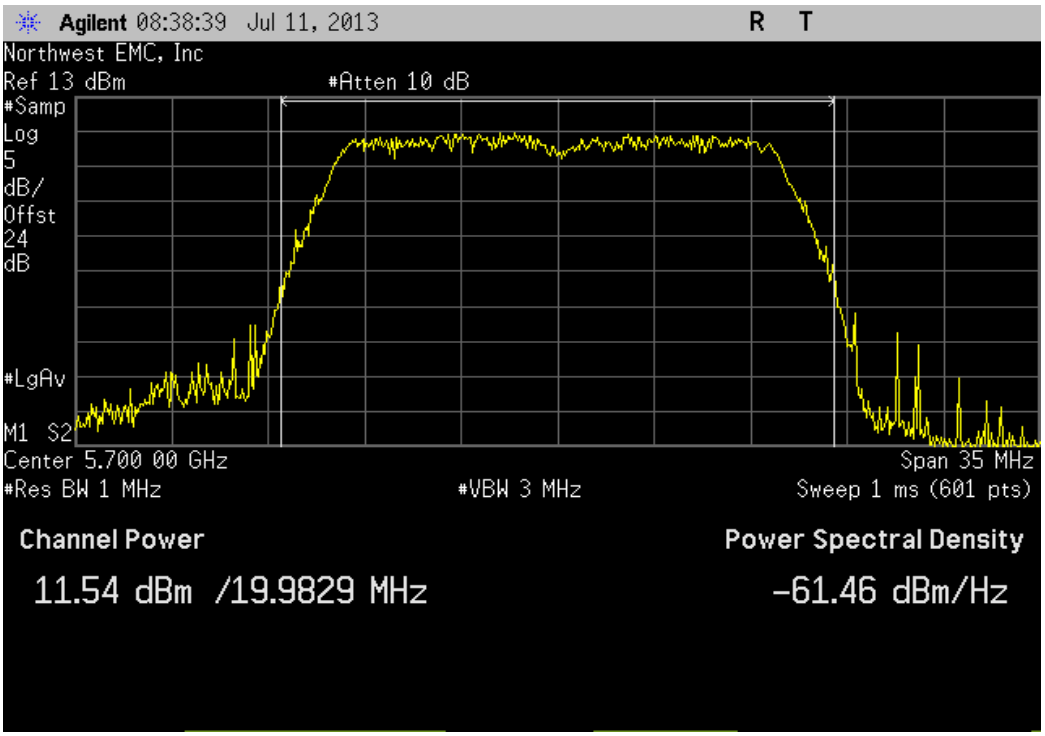
				Value	Limit	Result
				12.785 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

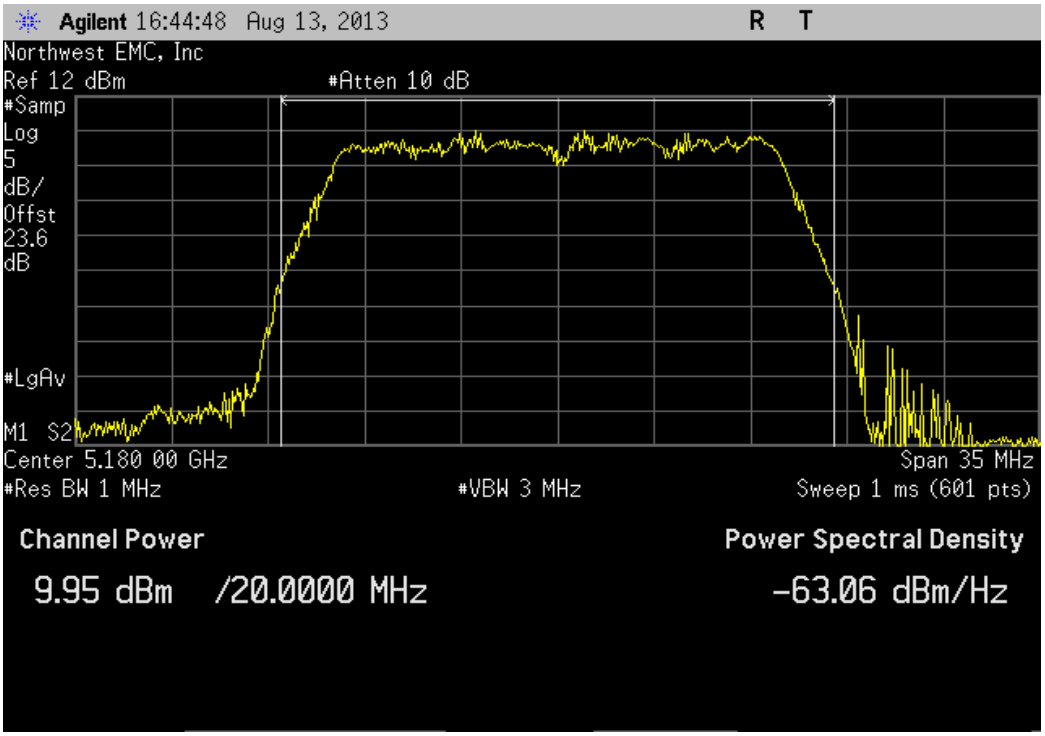
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.543 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

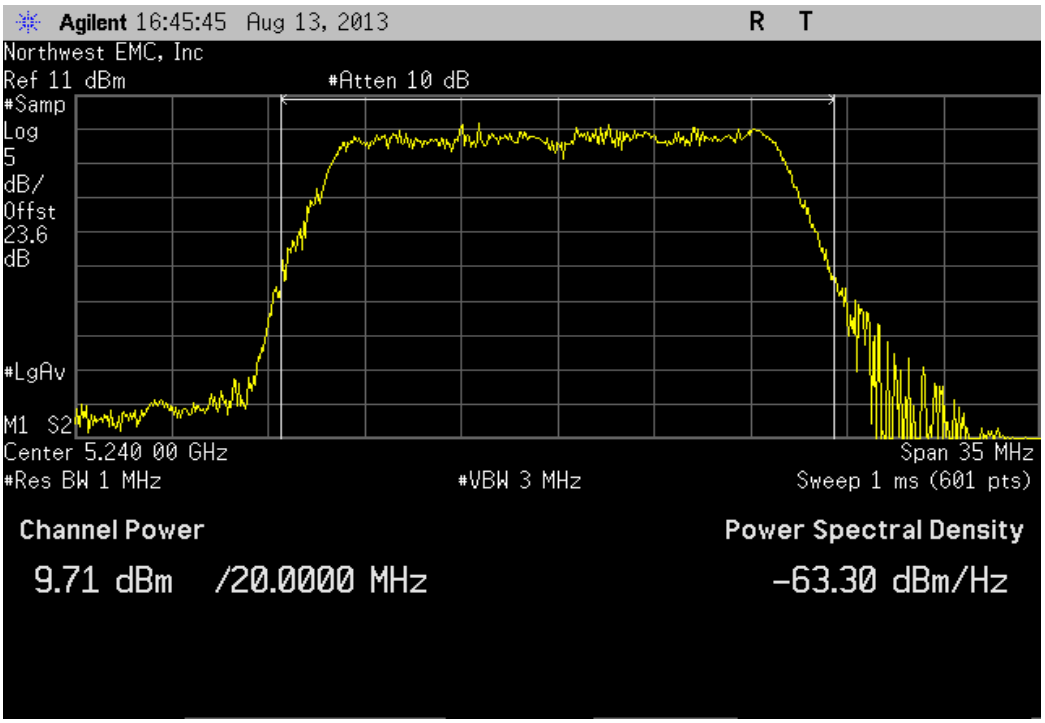
				Value	Limit	Result
				9.946 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

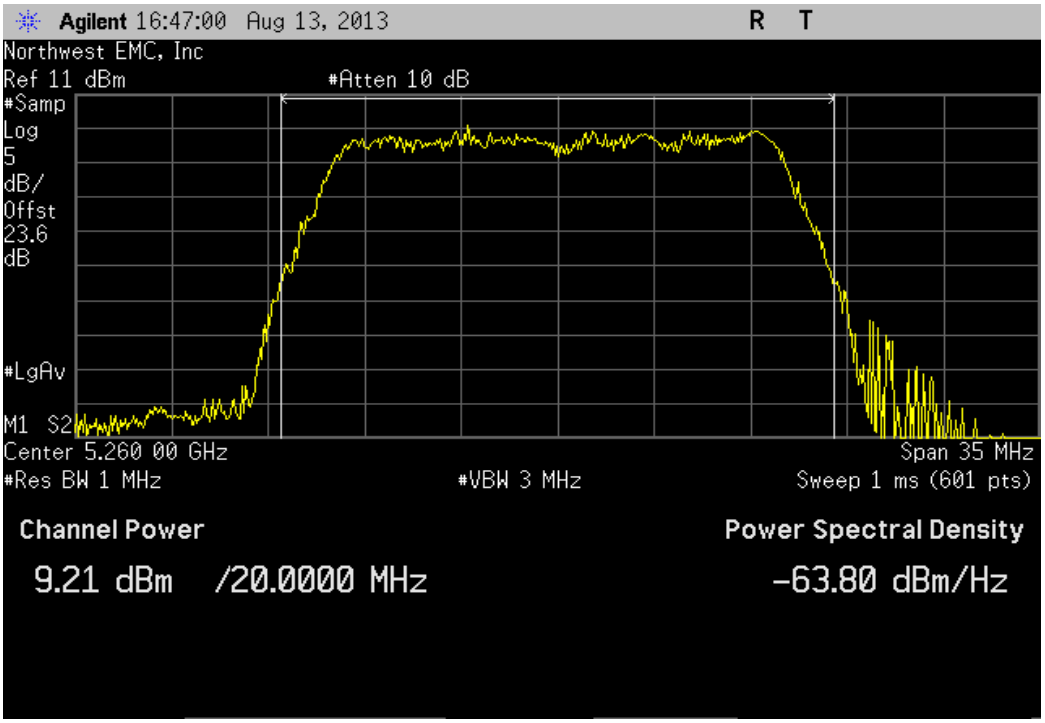
20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				9.709 dBm	< 17 dBm	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz

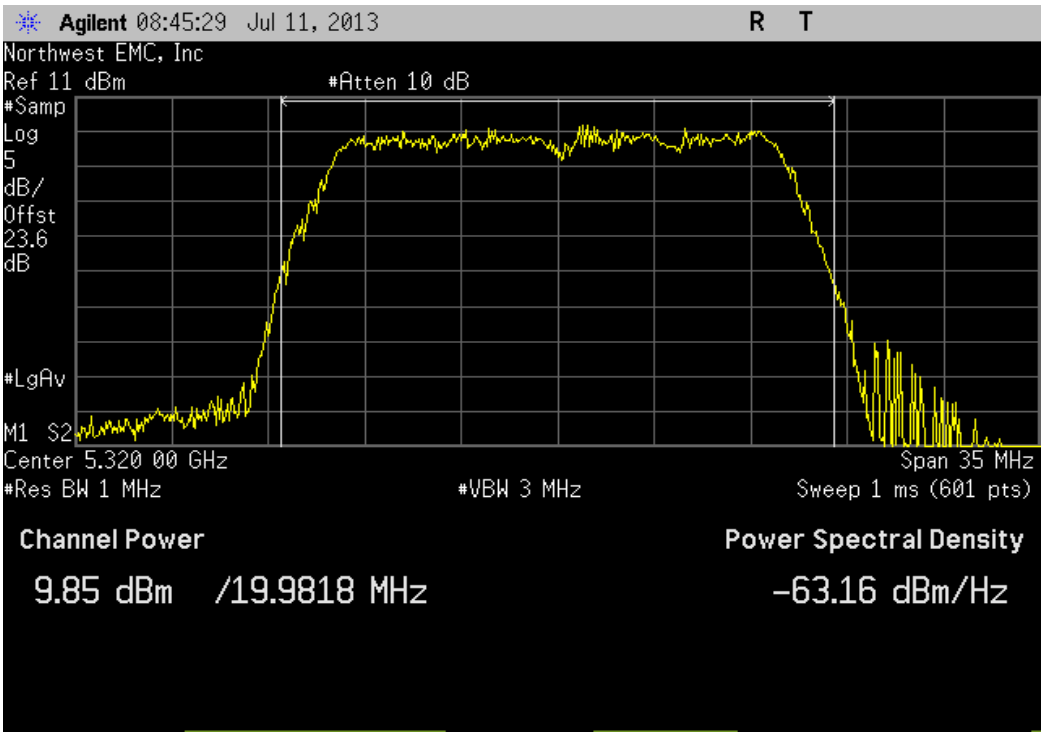
				Value	Limit	Result
				9.214 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

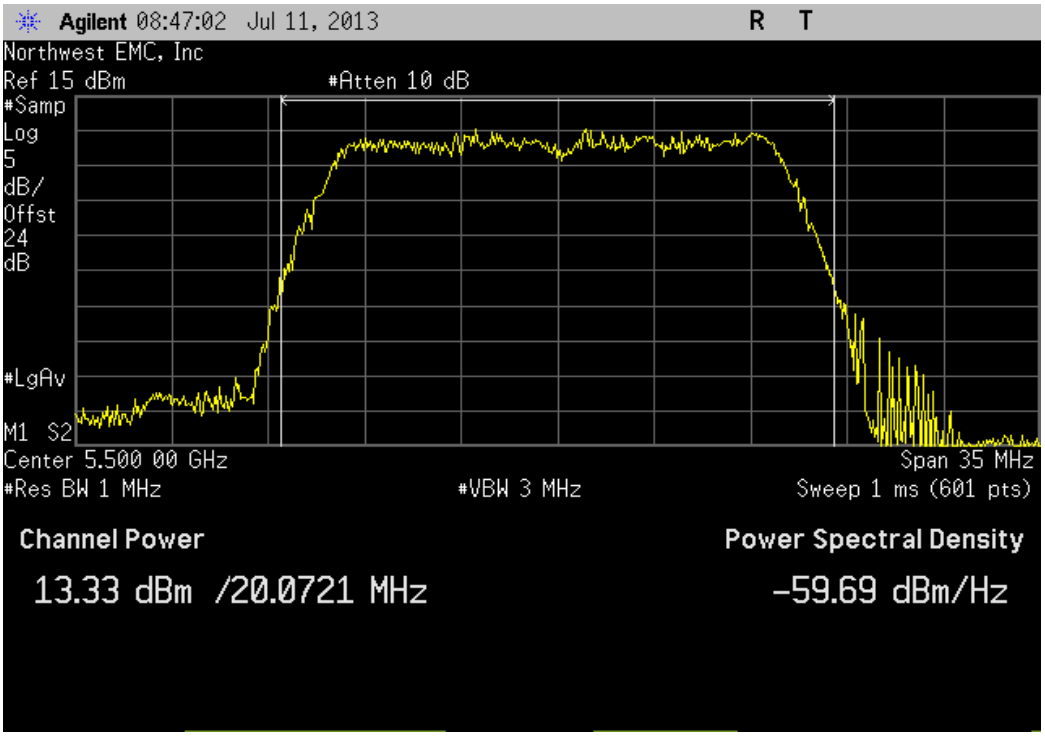
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				9.85 dBm	< 24 dBm	Pass



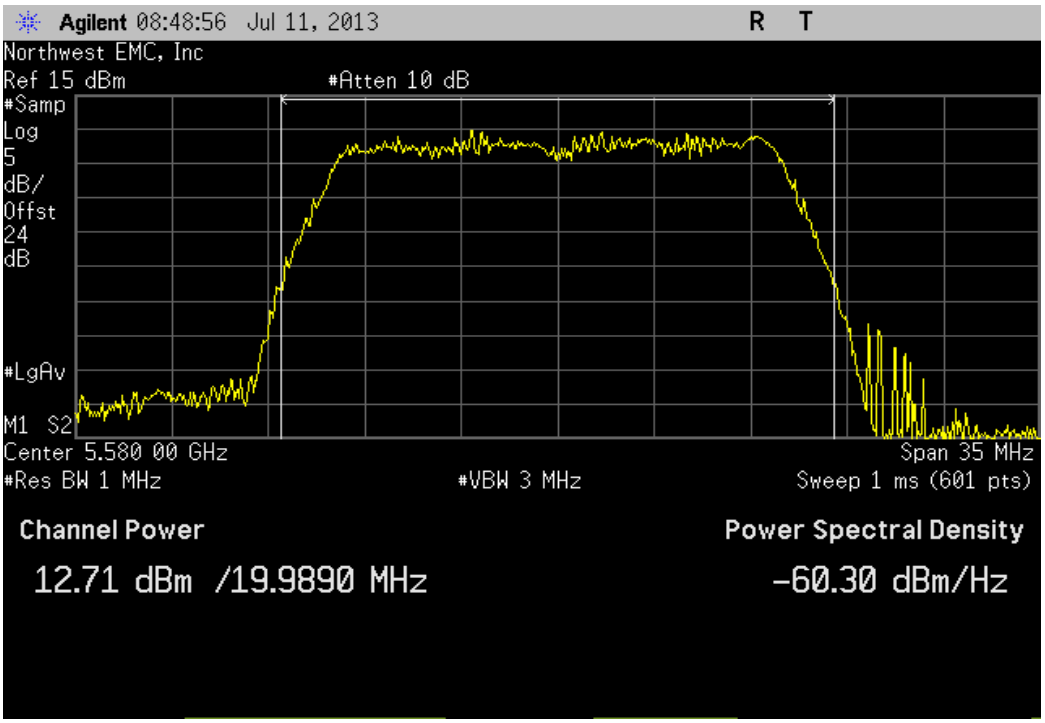
20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				13.332 dBm	< 24 dBm	Pass

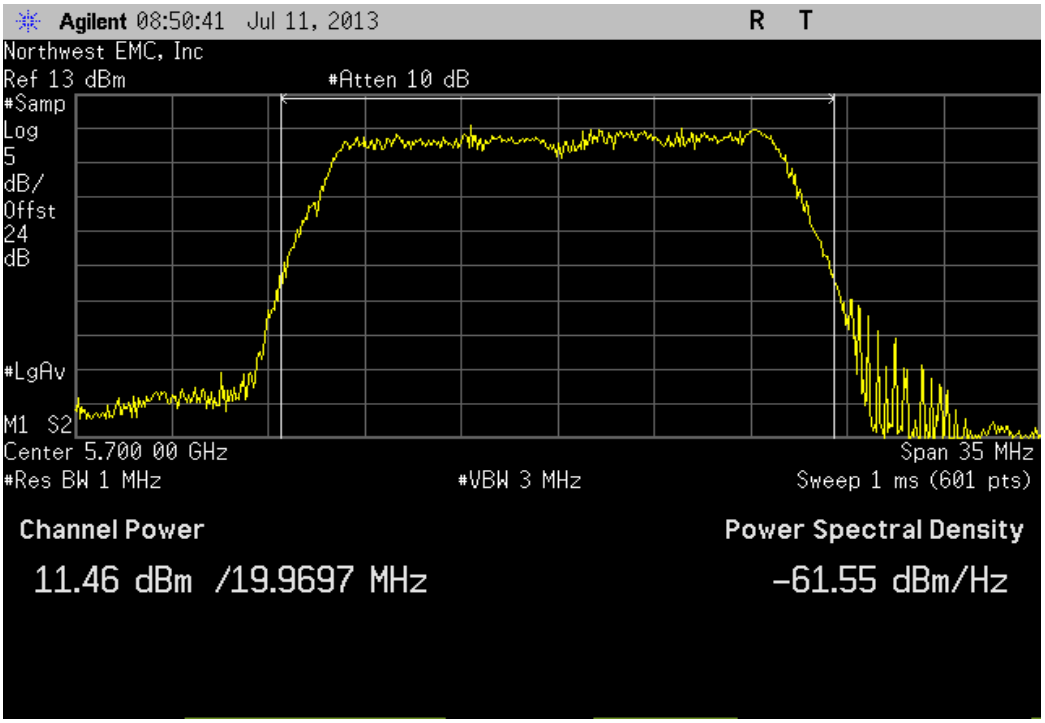


Peak Transmit Power - Antenna A

20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				12.712 dBm	< 24 dBm	Pass



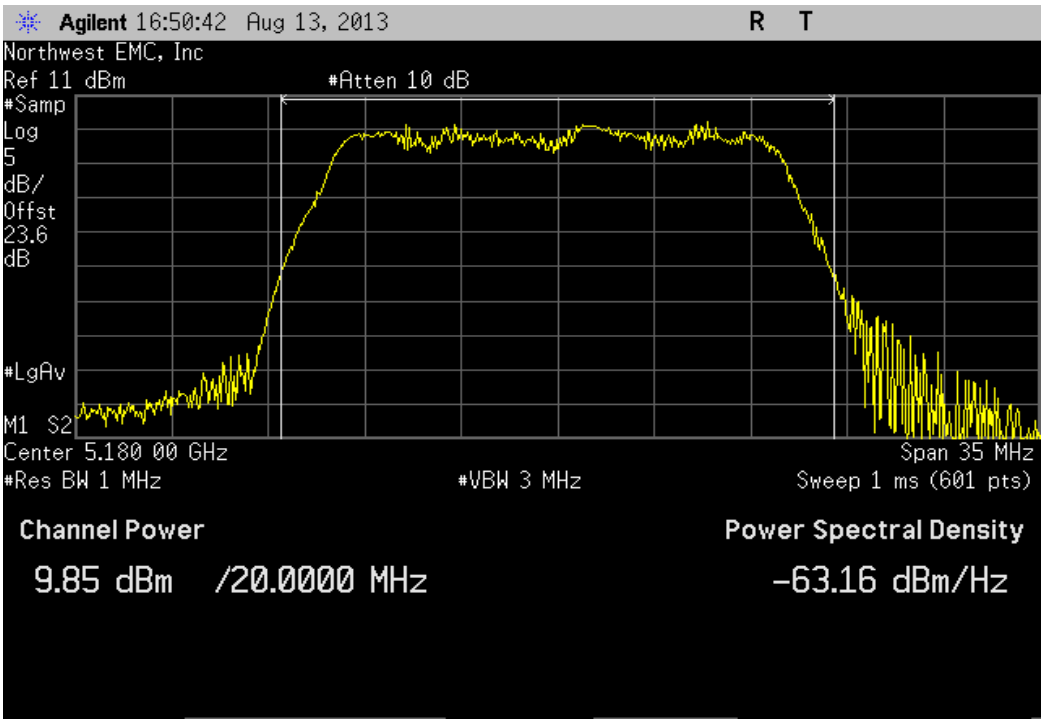
20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				11.457 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

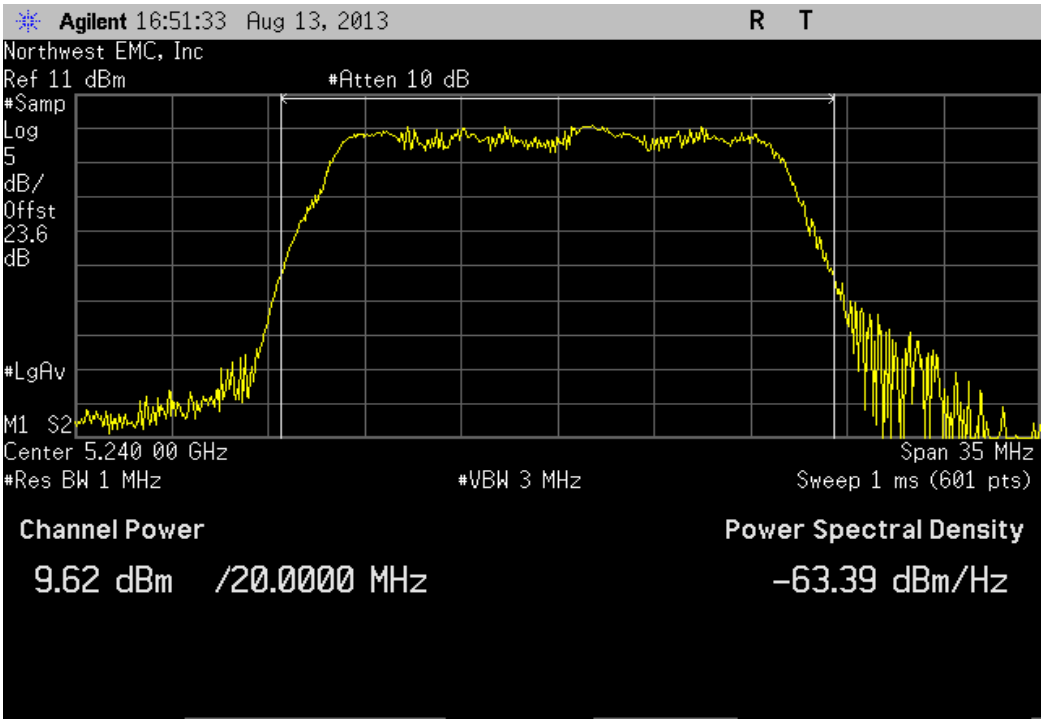
20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				9.849 dBm	< 17 dBm	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz

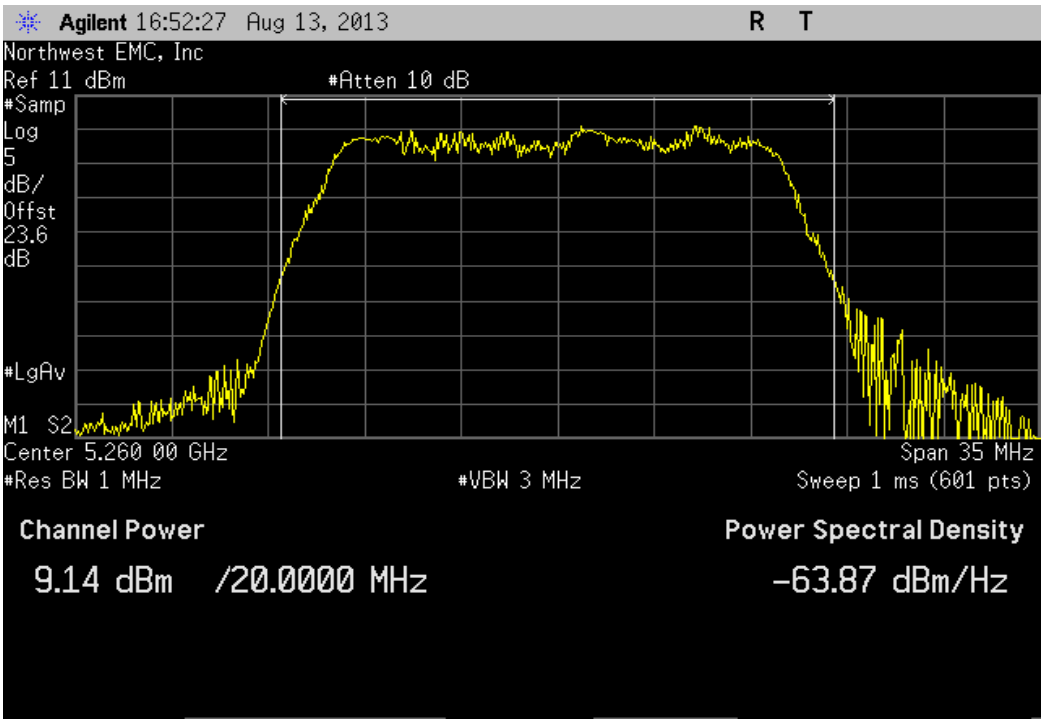
				Value	Limit	Result
				9.625 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

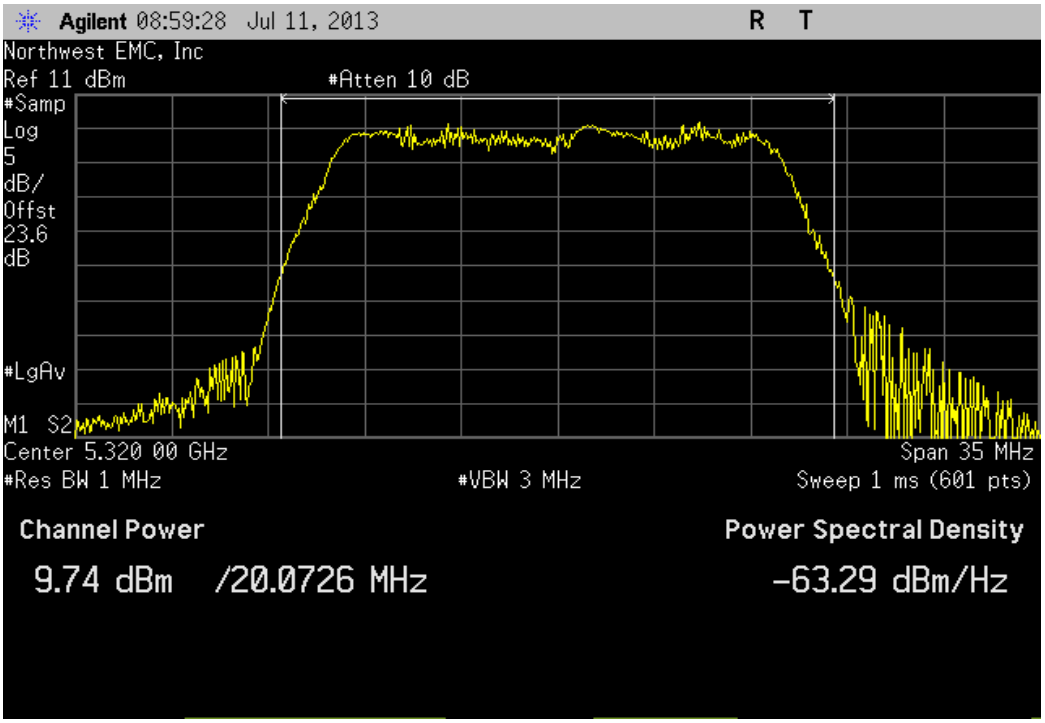
20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				9.139 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz

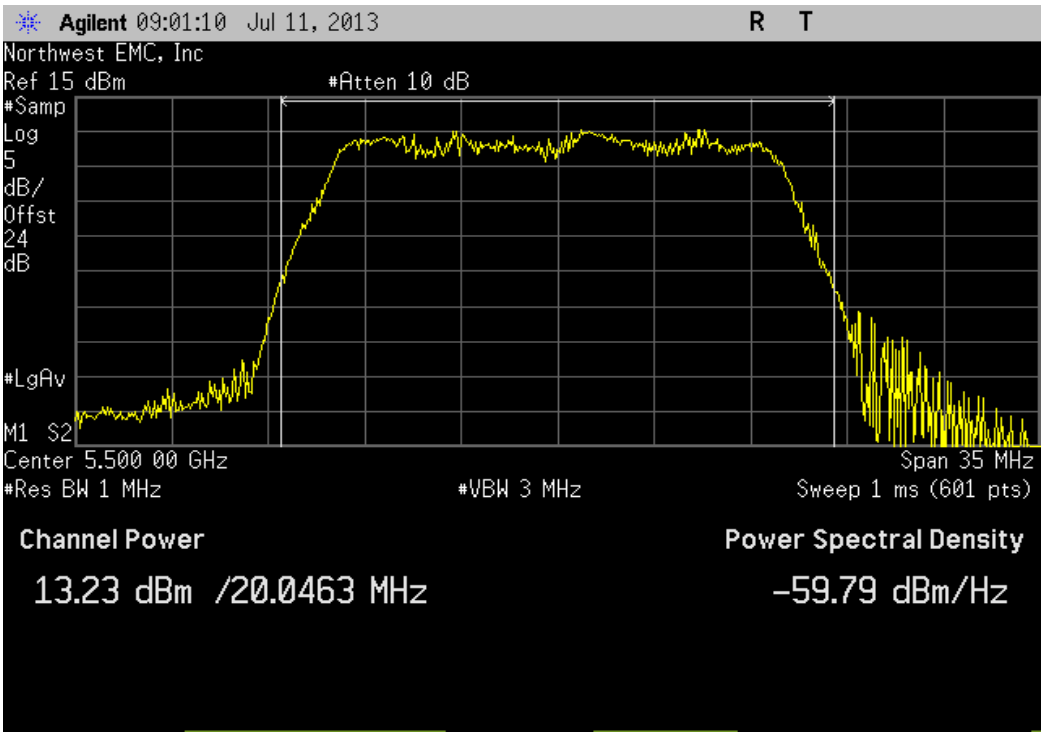
				Value	Limit	Result
				9.739 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

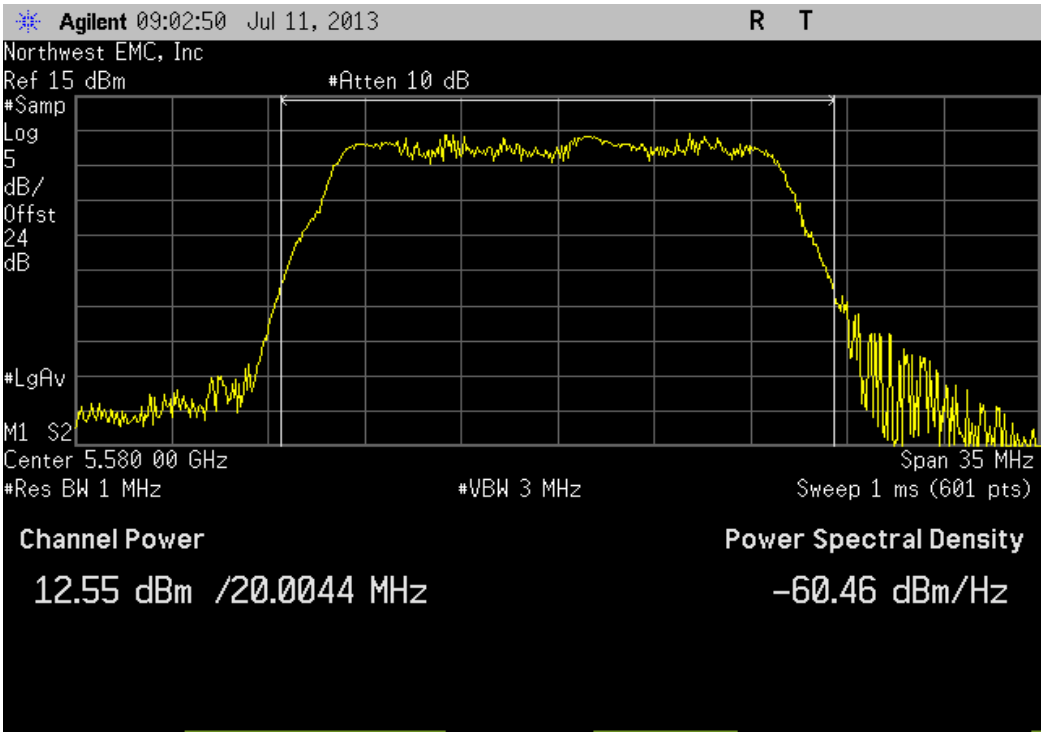
20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				13.229 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz

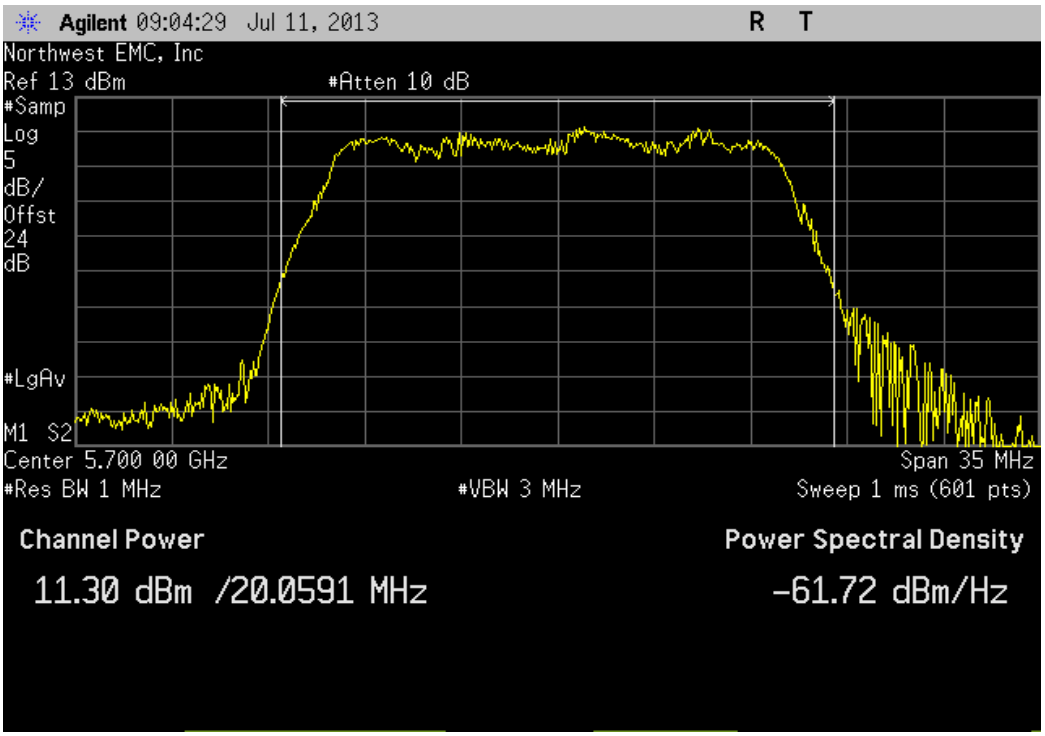
				Value	Limit	Result
				12.552 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

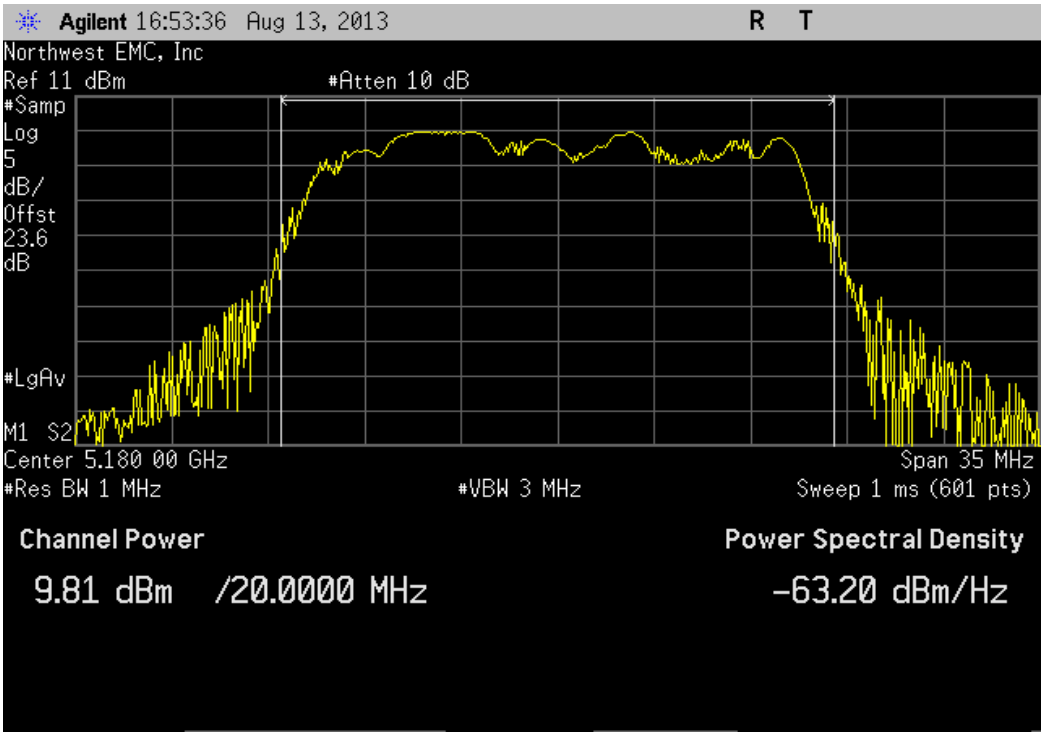
20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				11.302 dBm	< 24 dBm	Pass



20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

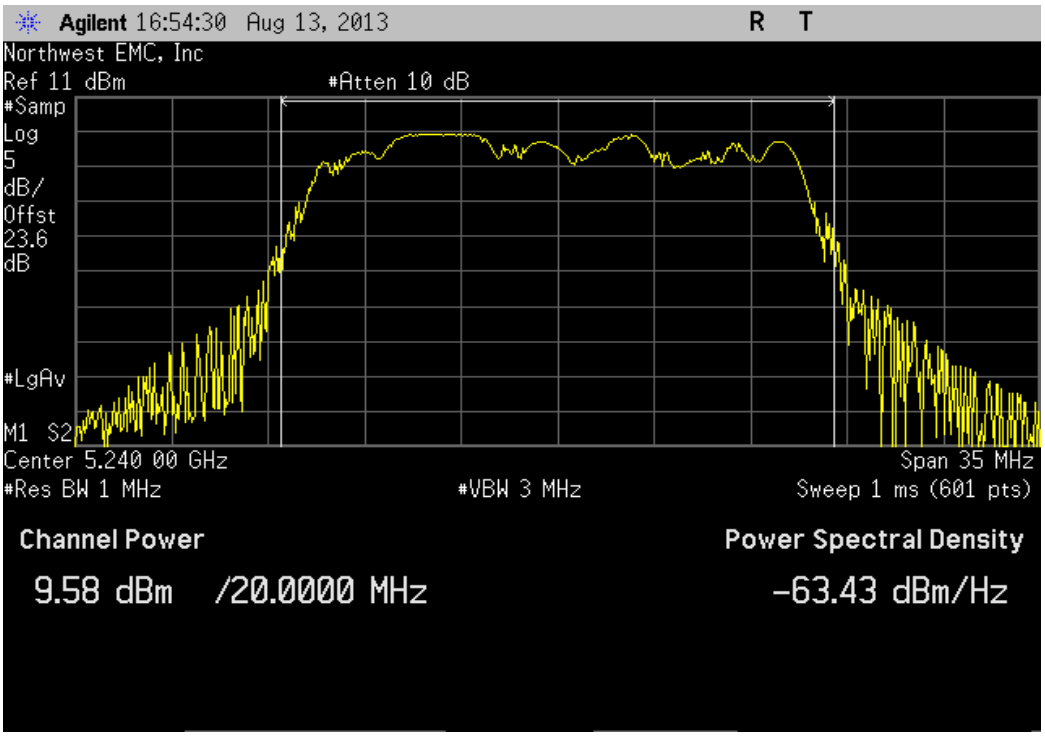
				Value	Limit	Result
				9.81 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

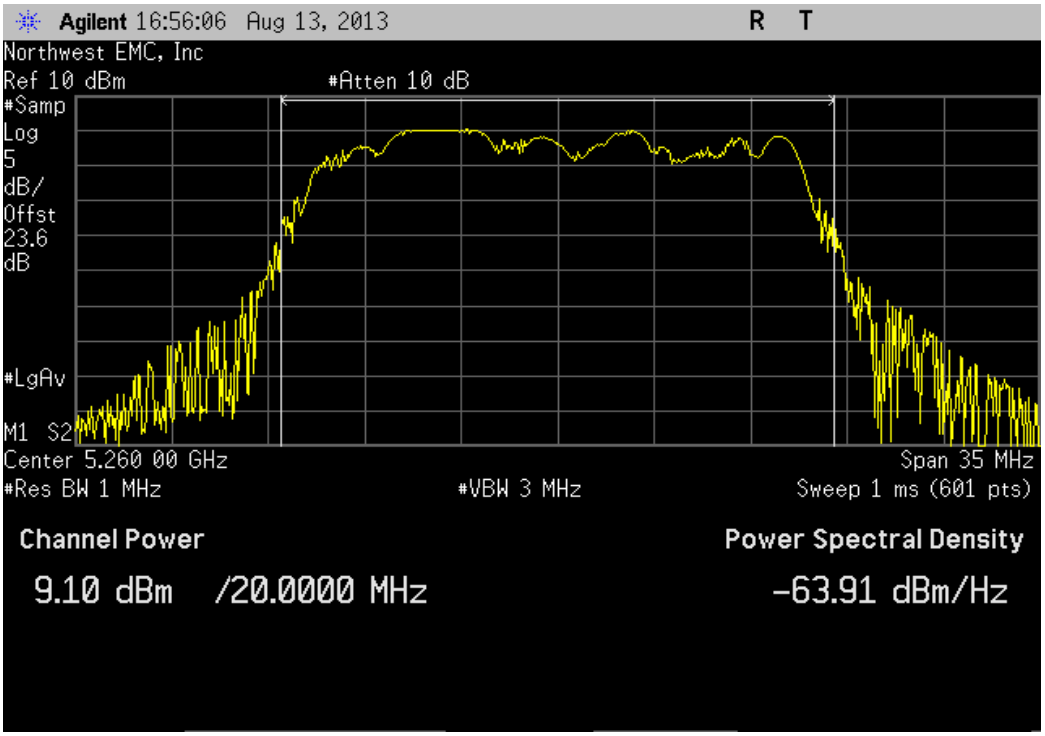
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				9.576 dBm	< 17 dBm	Pass



20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

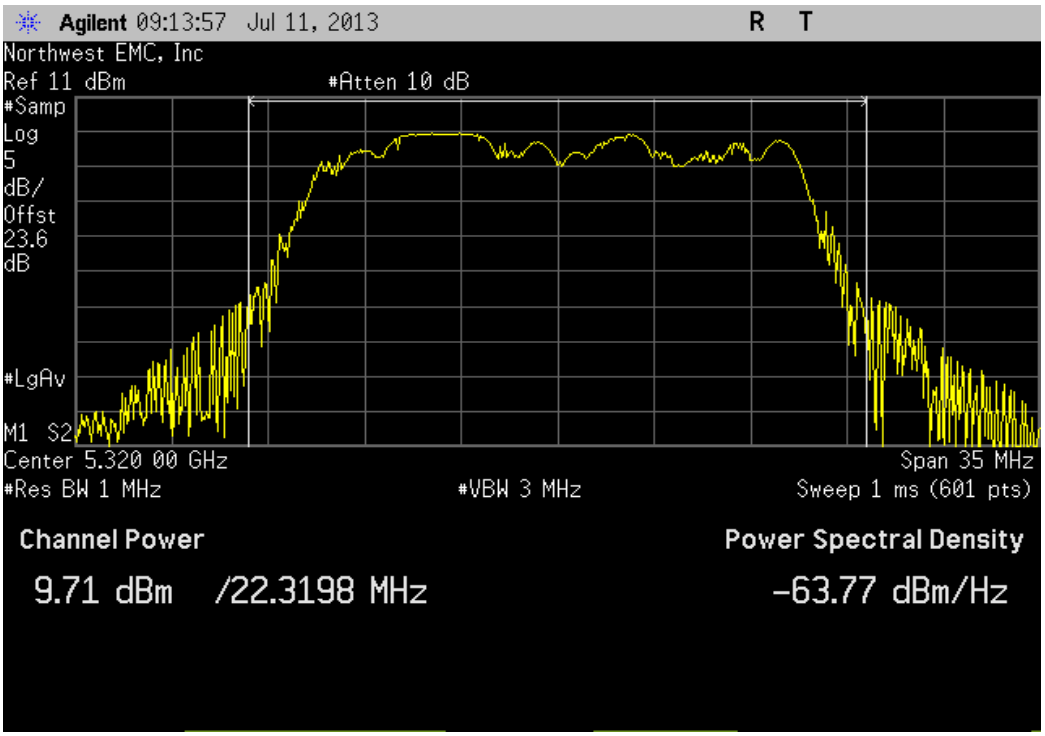
				Value	Limit	Result
				9.102 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

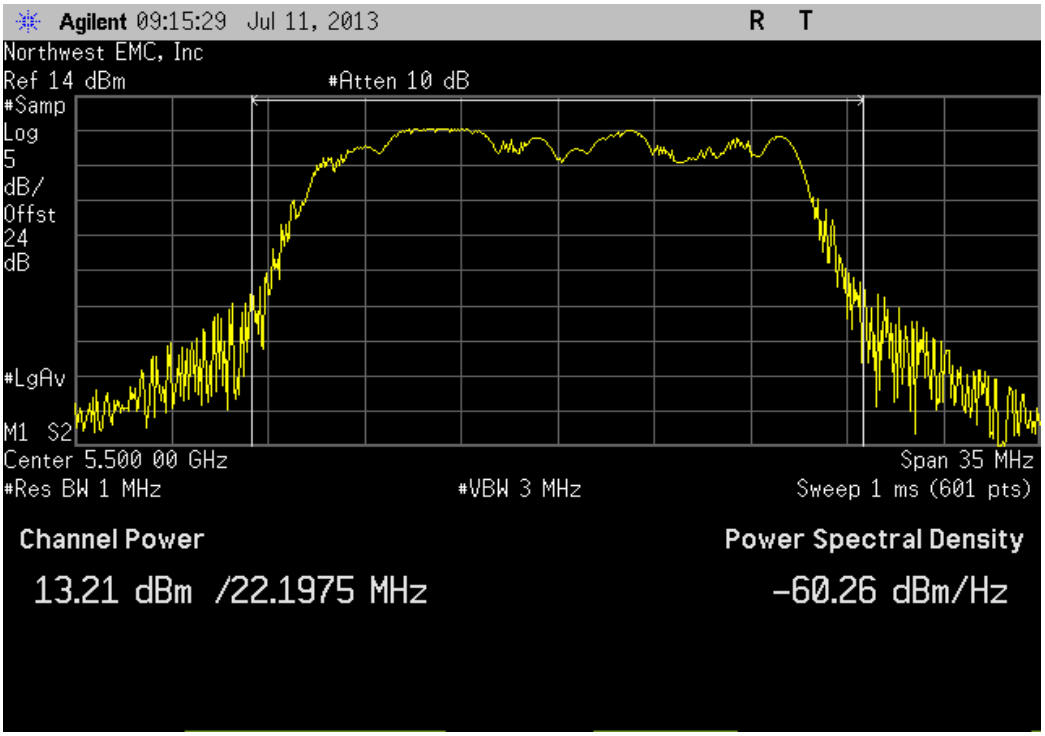
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				9.713 dBm	< 24 dBm	Pass



20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

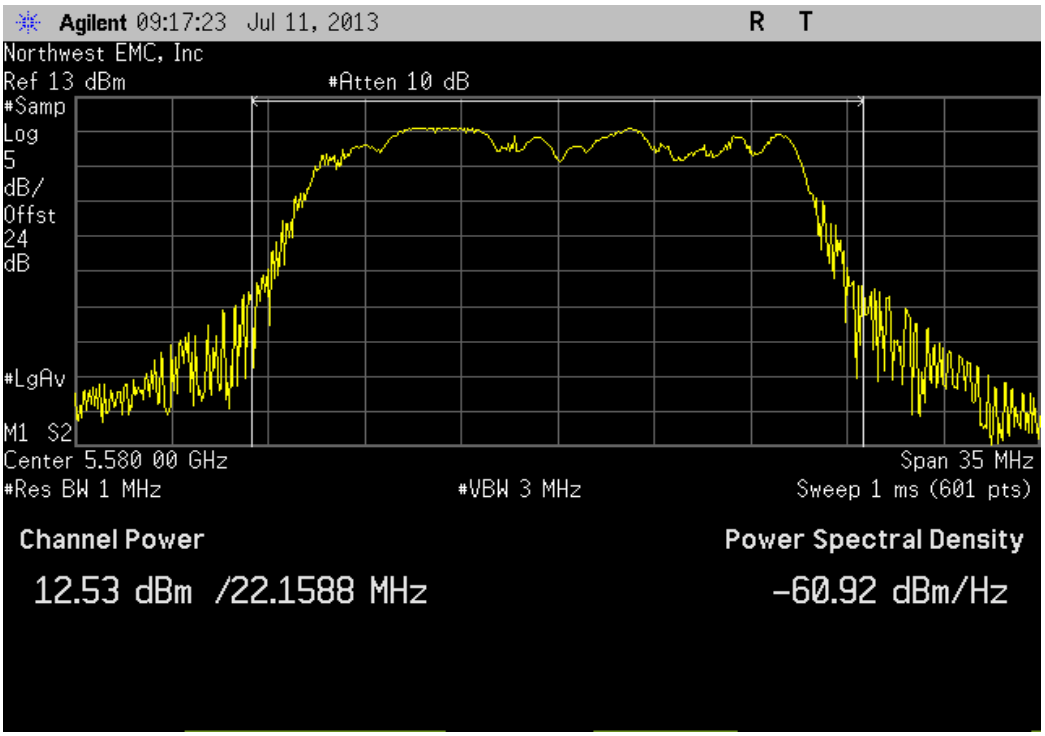
				Value	Limit	Result
				13.207 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

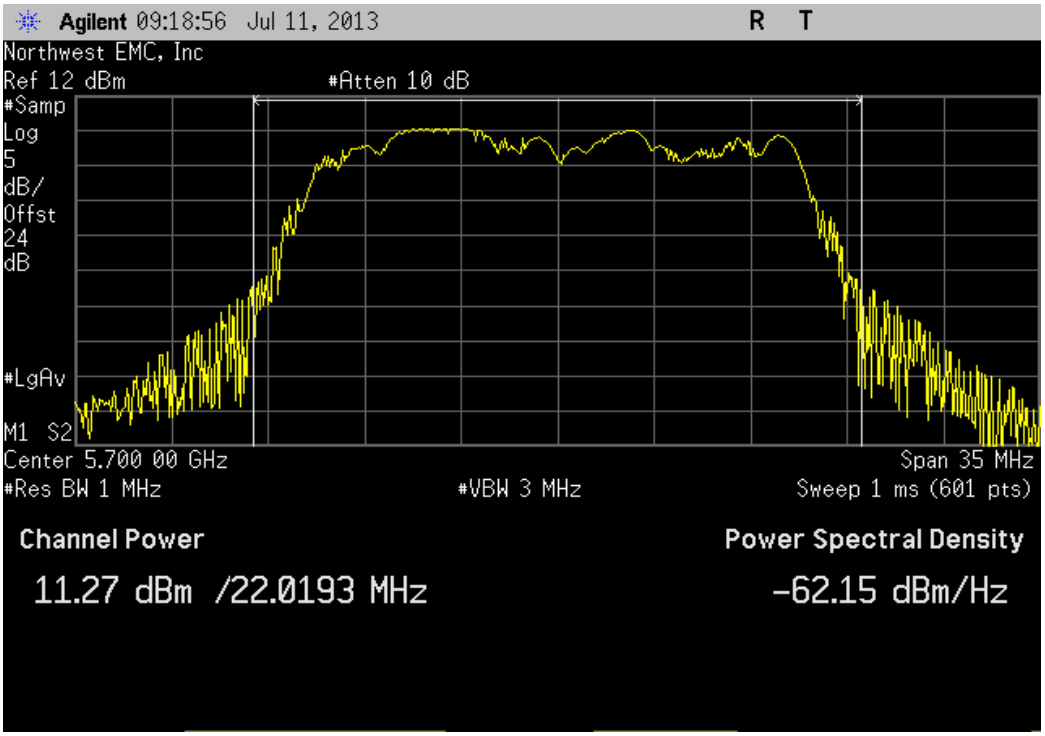
20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				12.532 dBm	< 24 dBm	Pass



20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz

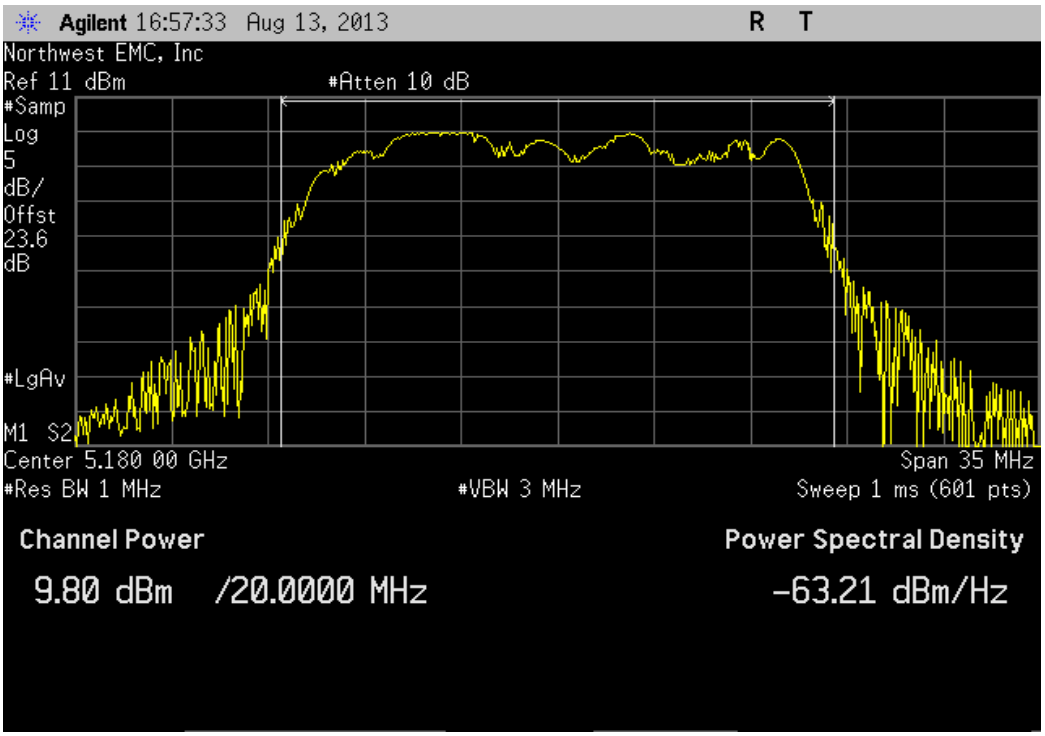
				Value	Limit	Result
				11.275 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

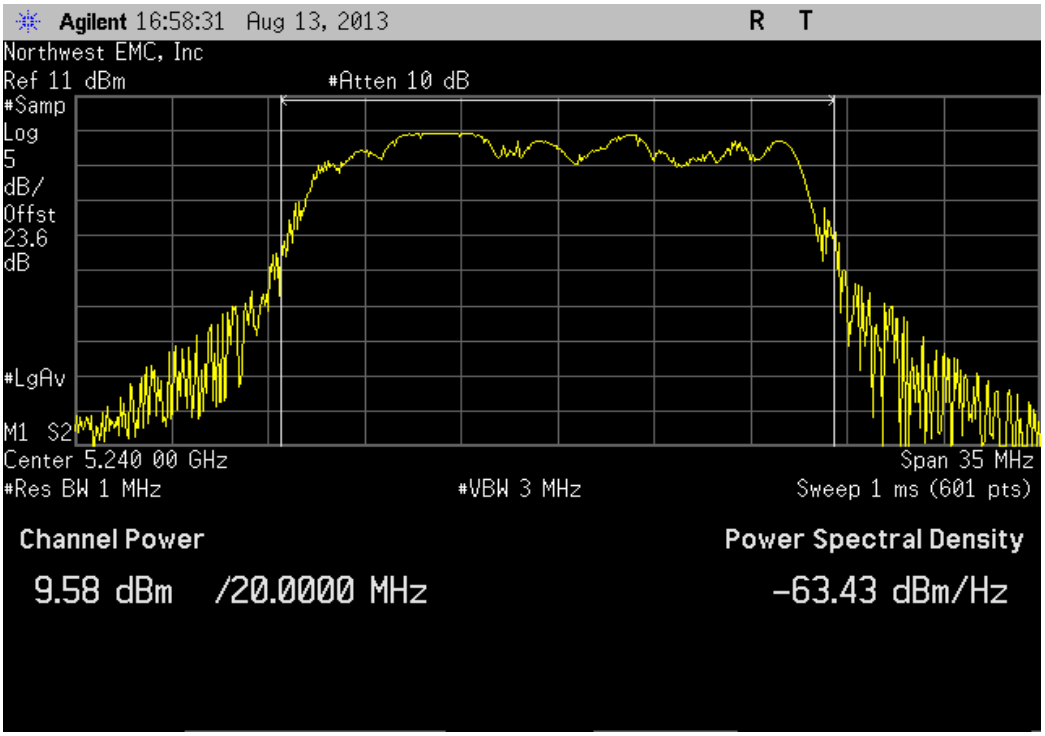
20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				9.805 dBm	< 17 dBm	Pass



20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz

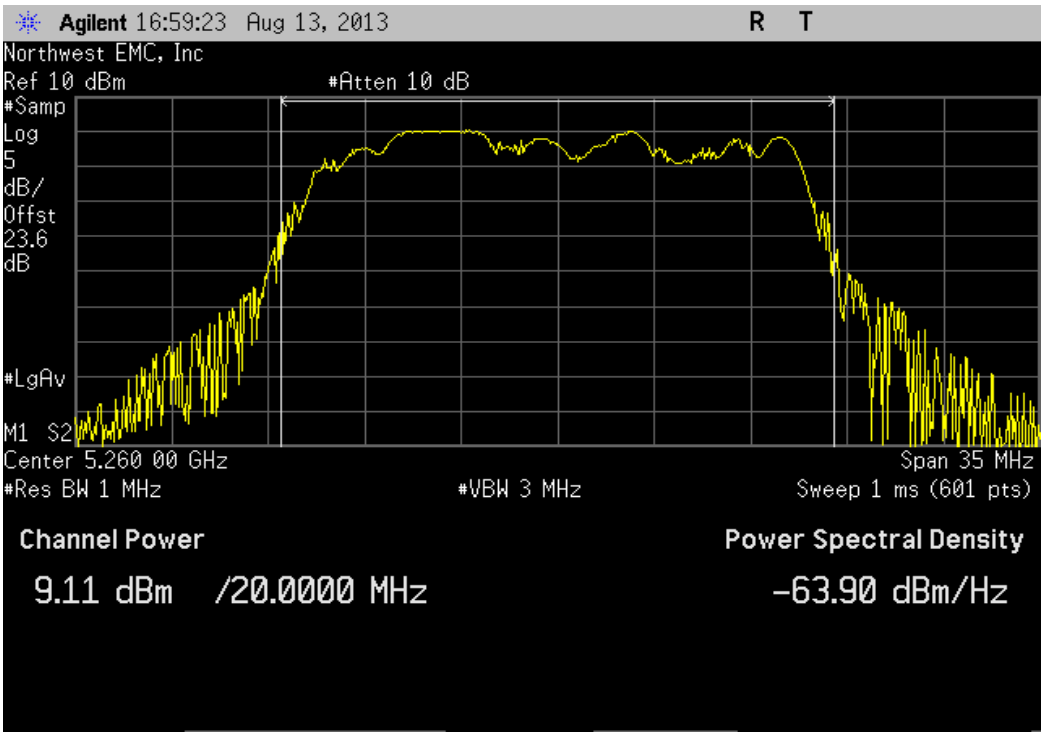
				Value	Limit	Result
				9.584 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

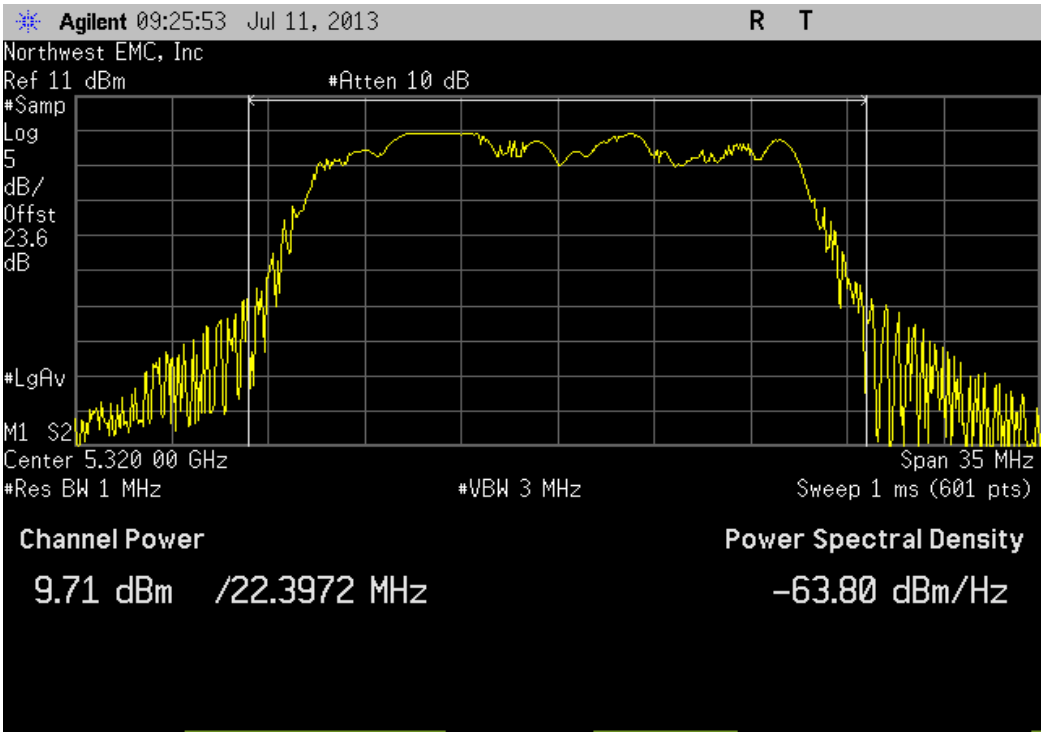
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				9.107 dBm	< 24 dBm	Pass



20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

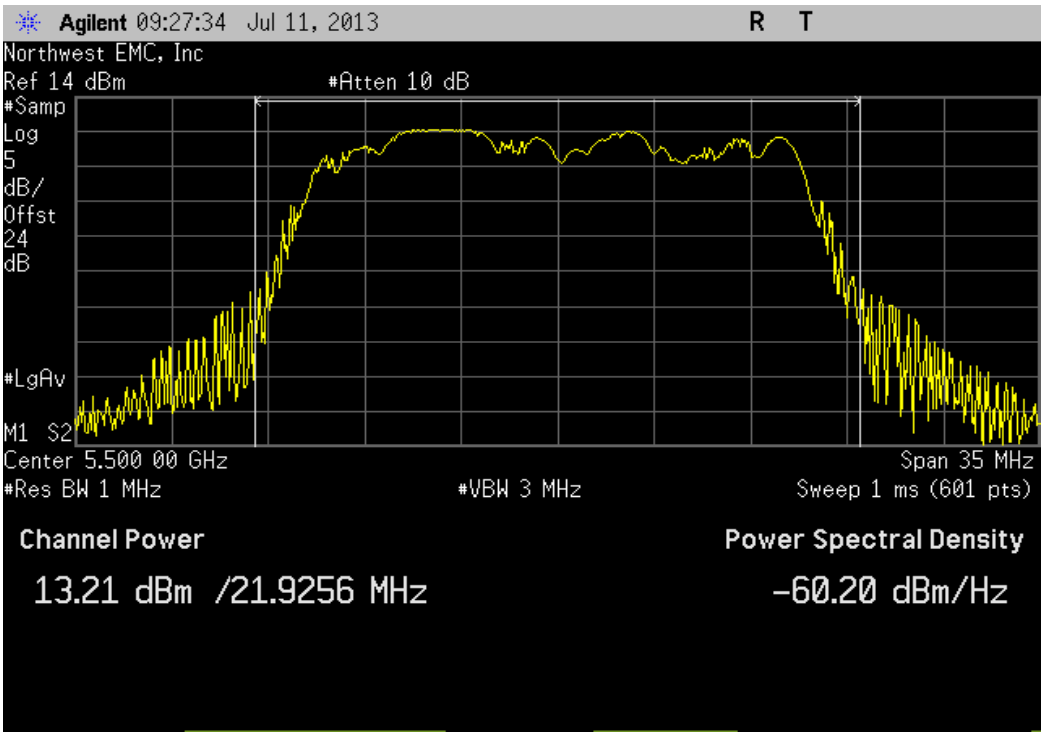
				Value	Limit	Result
				9.706 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

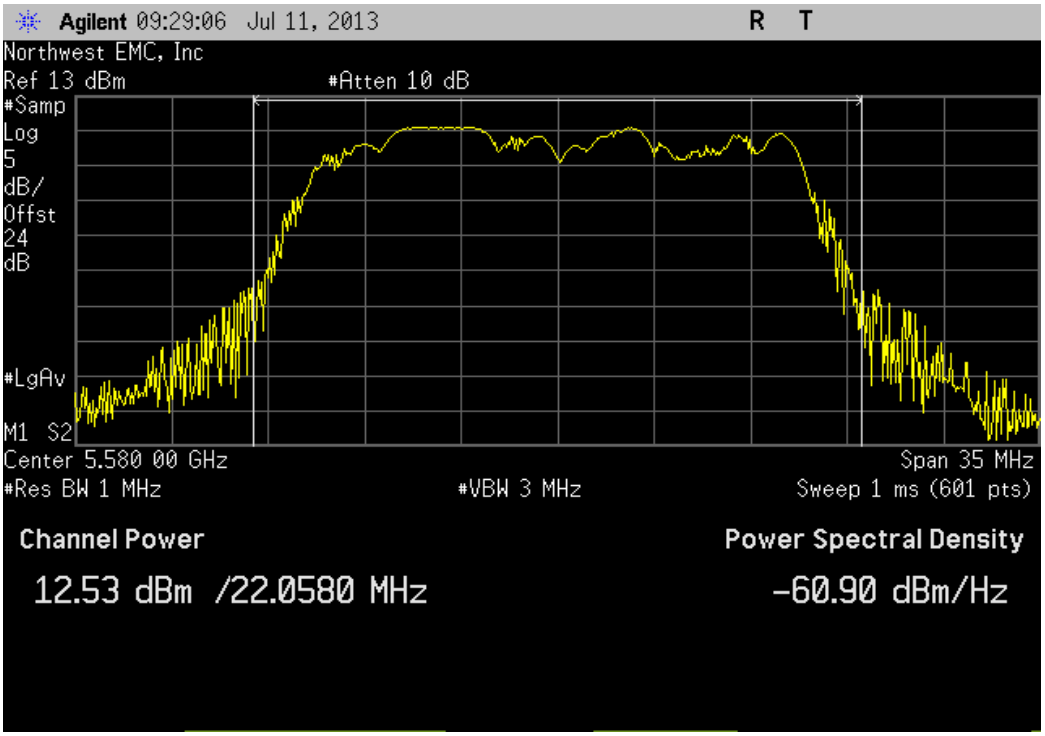
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				13.209 dBm	< 24 dBm	Pass



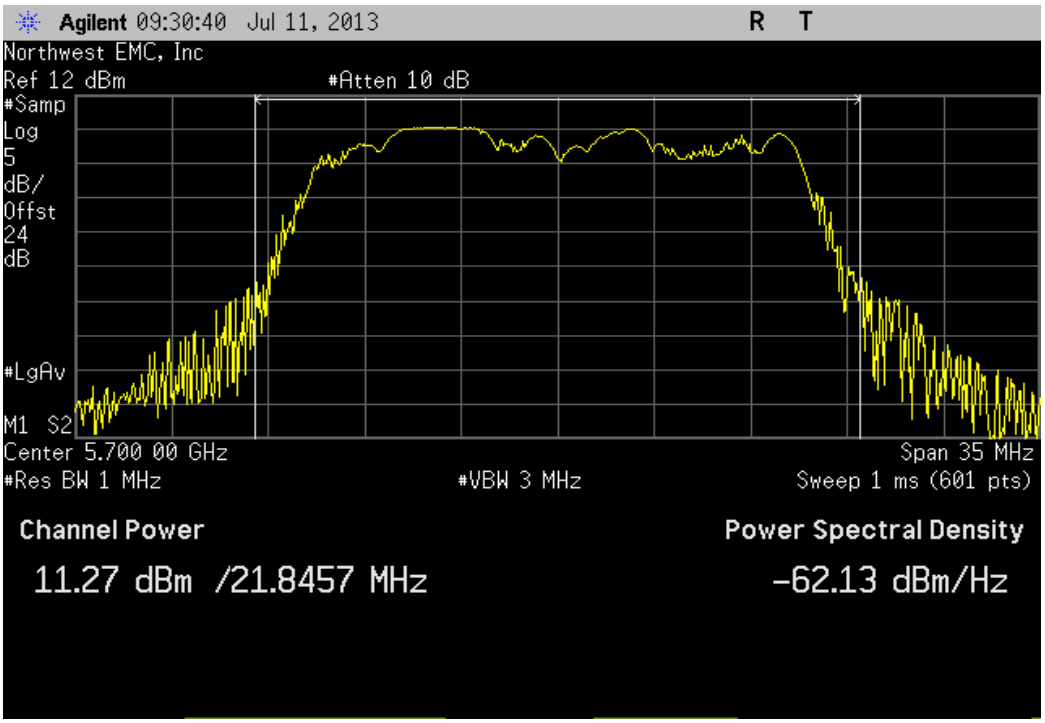
20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				12.533 dBm	< 24 dBm	Pass

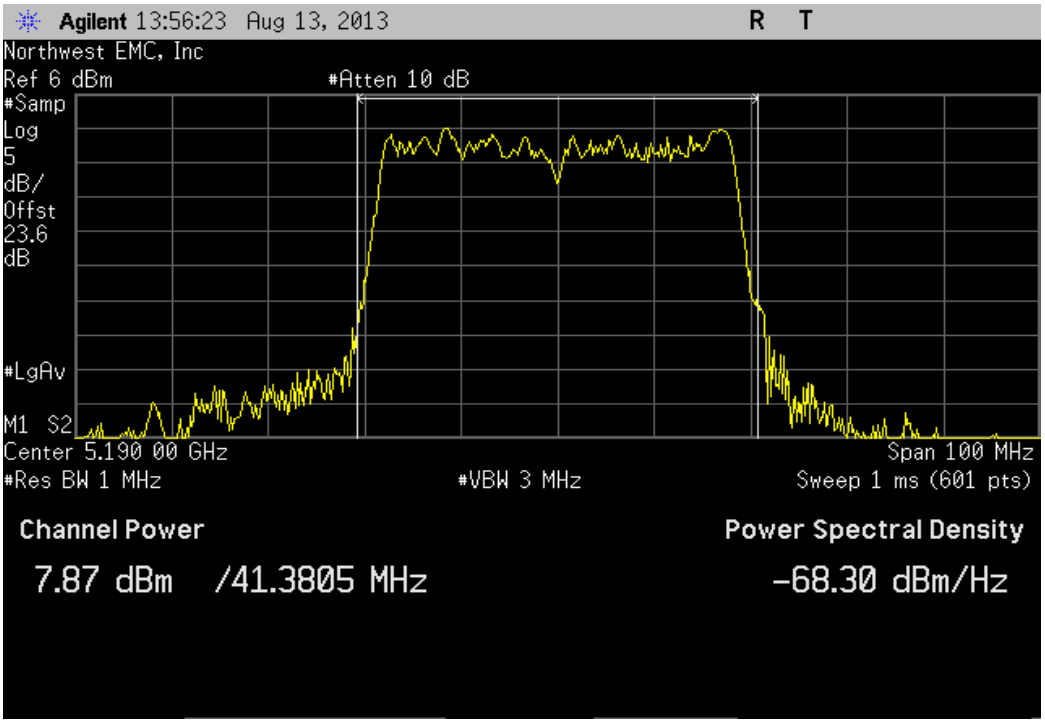


Peak Transmit Power - Antenna A

20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				11.267 dBm	< 24 dBm	Pass



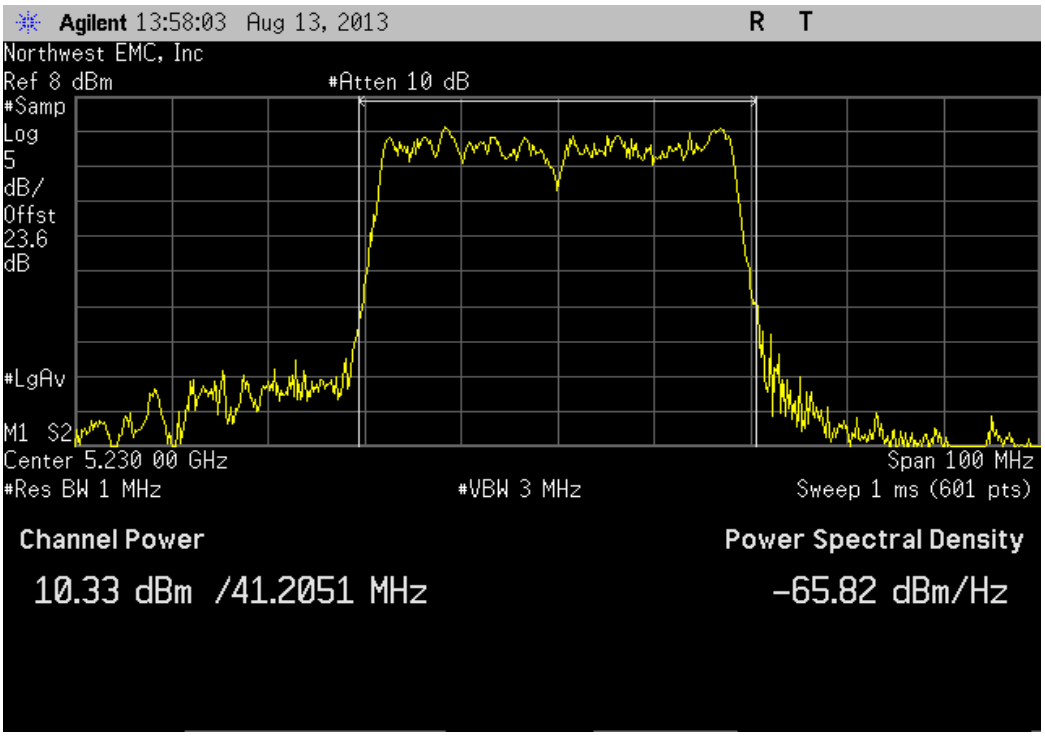
40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz						
				Value	Limit	Result
				7.872 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

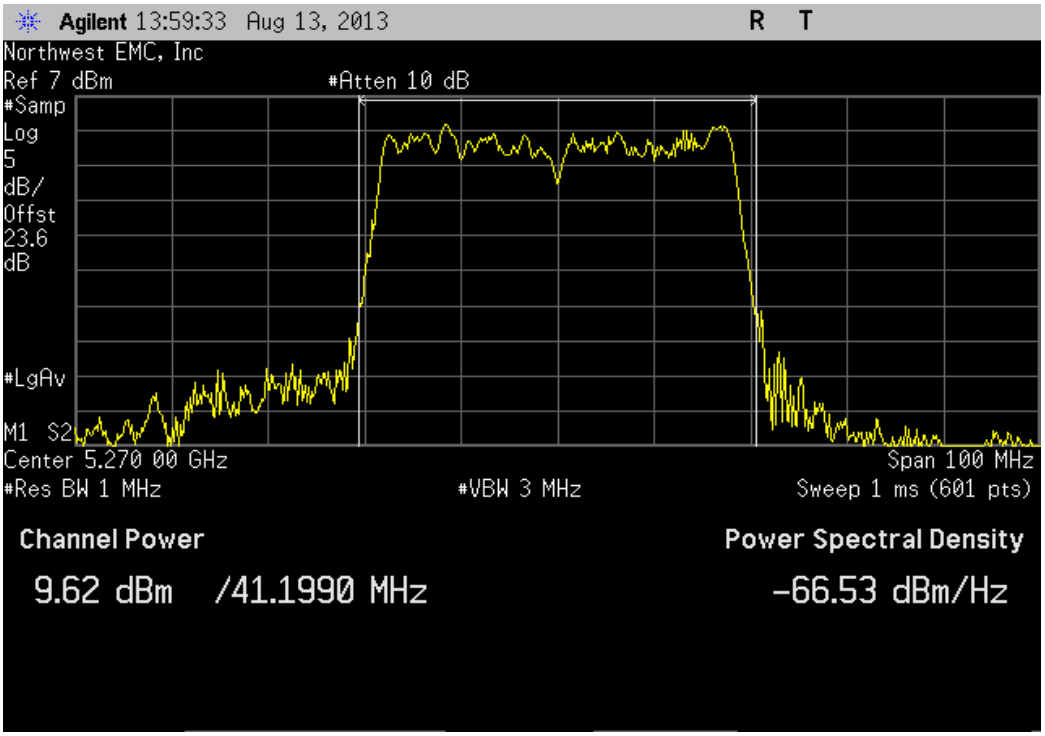
40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				10.332 dBm	< 17 dBm	Pass



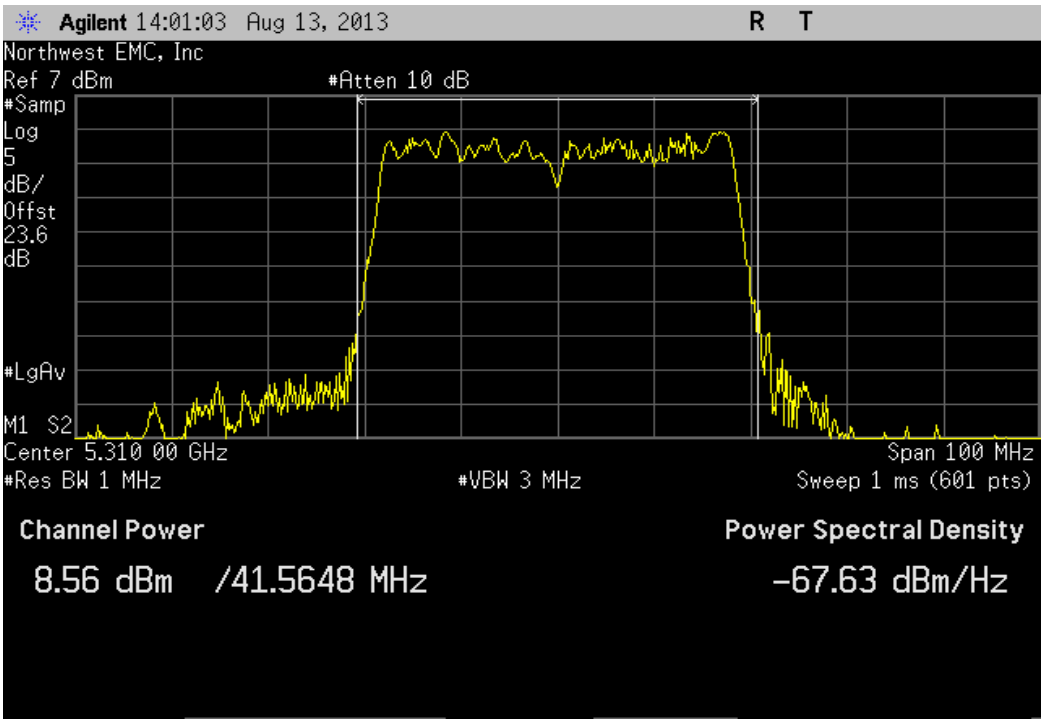
40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				9.62 dBm	< 24 dBm	Pass

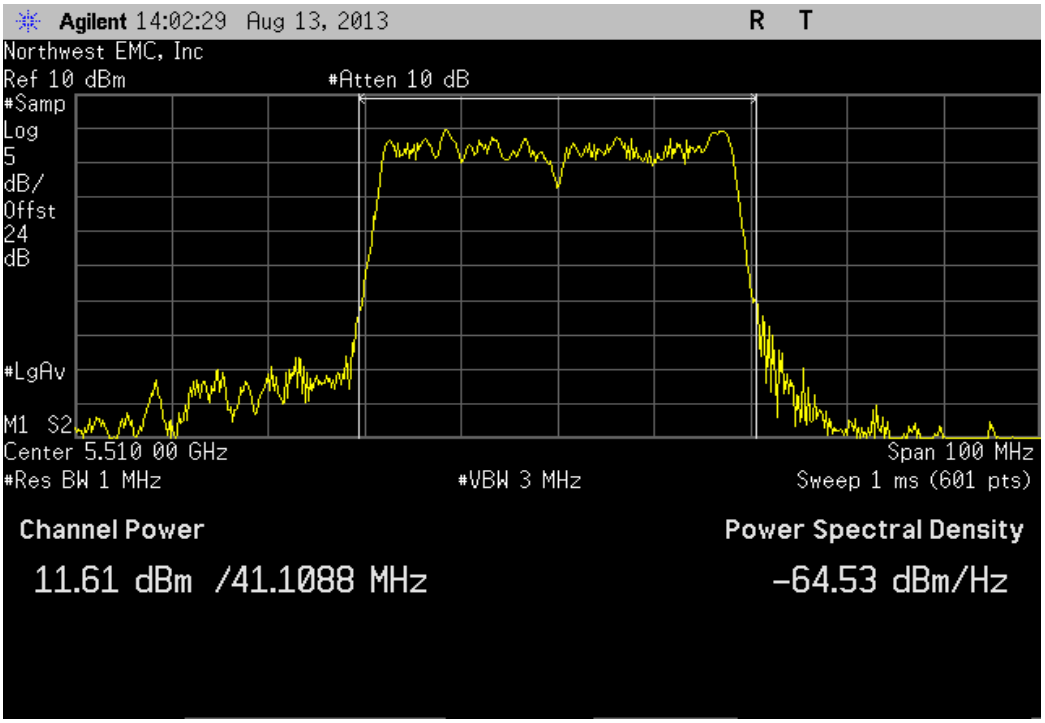


Peak Transmit Power - Antenna A

40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	Result
				8.559 dBm	< 24 dBm	Pass



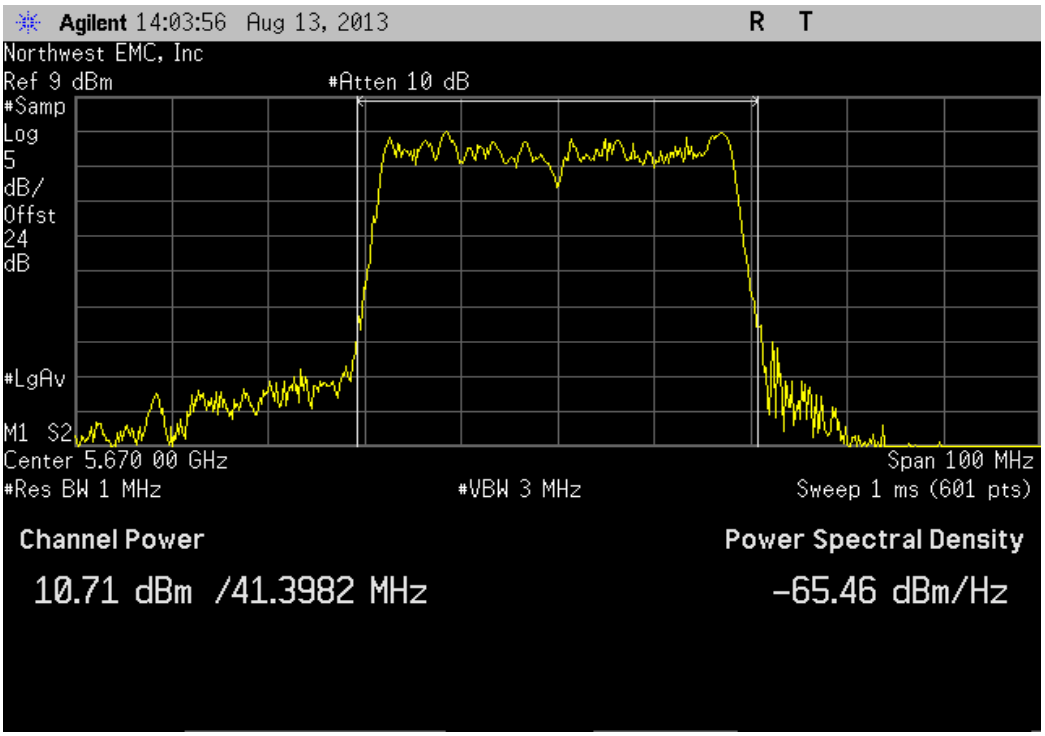
40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz						
				Value	Limit	Result
				11.61 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

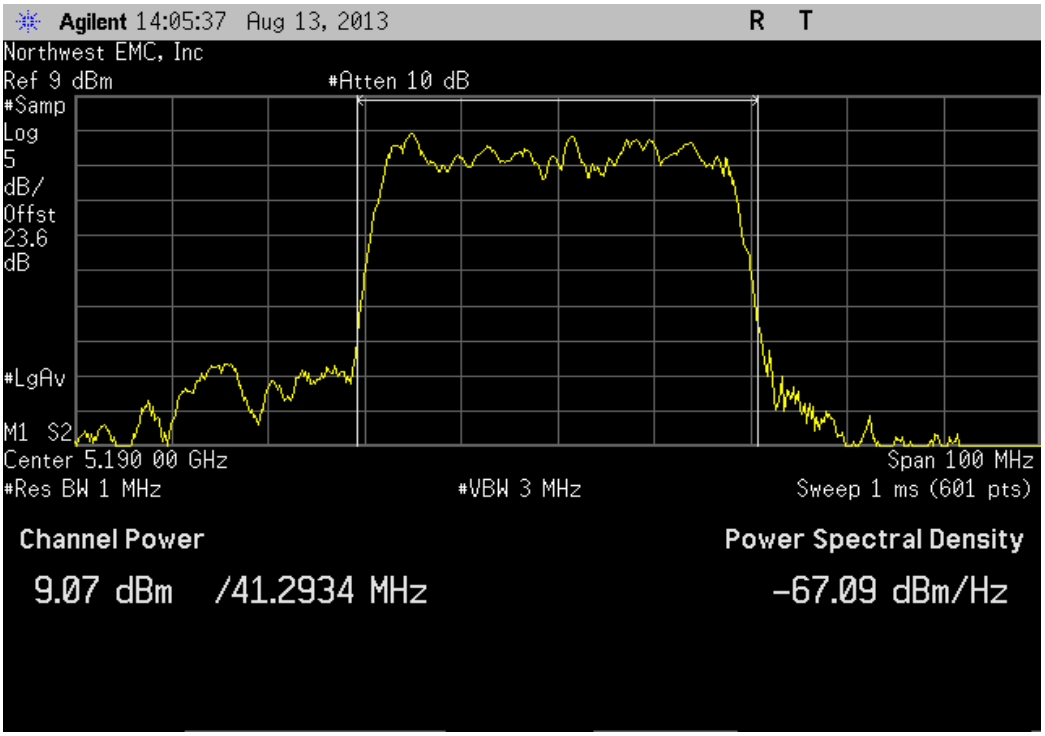
40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				10.713 dBm	< 24 dBm	Pass



40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

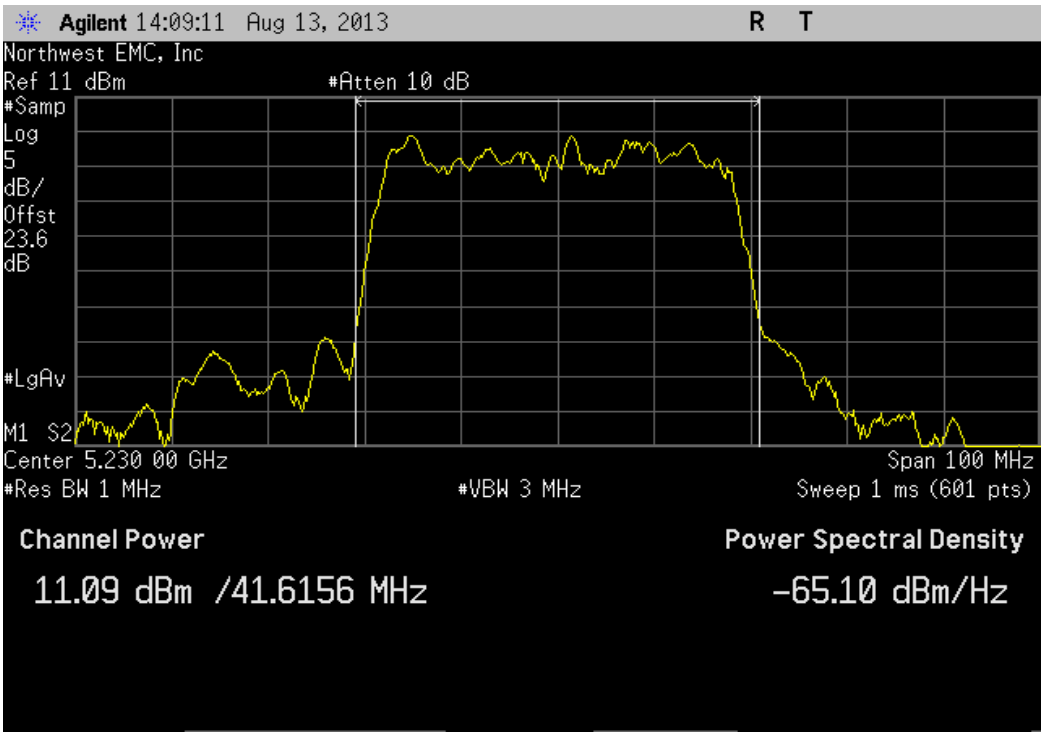
				Value	Limit	Result
				9.074 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna A

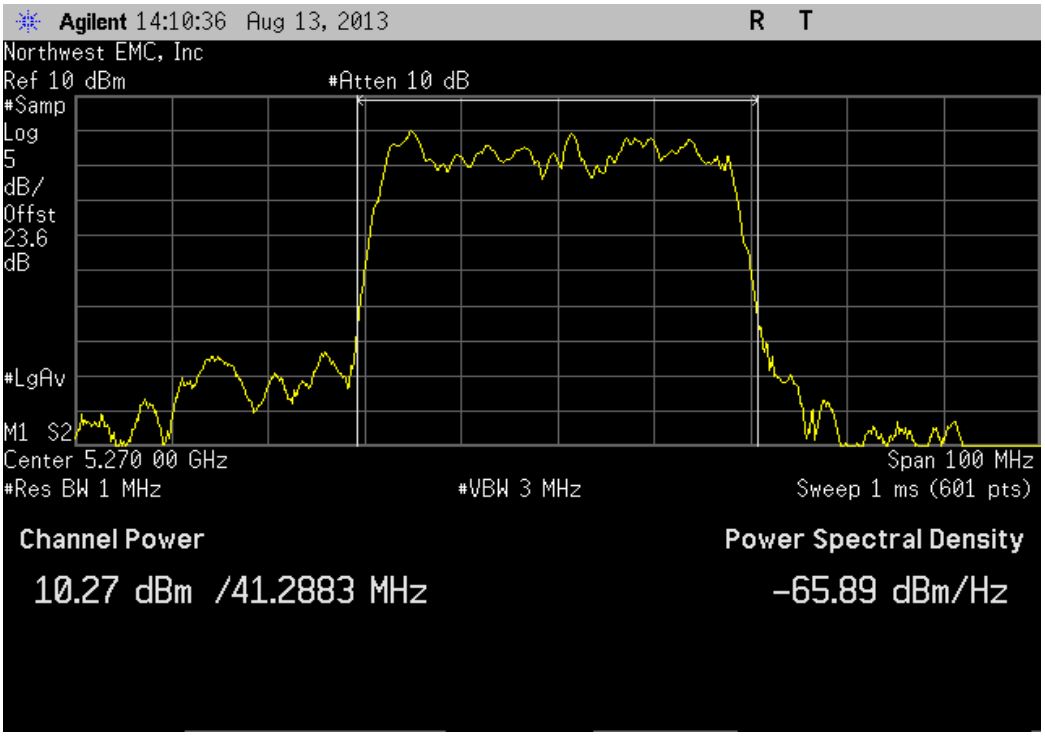
40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				11.091 dBm	< 17 dBm	Pass



40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz

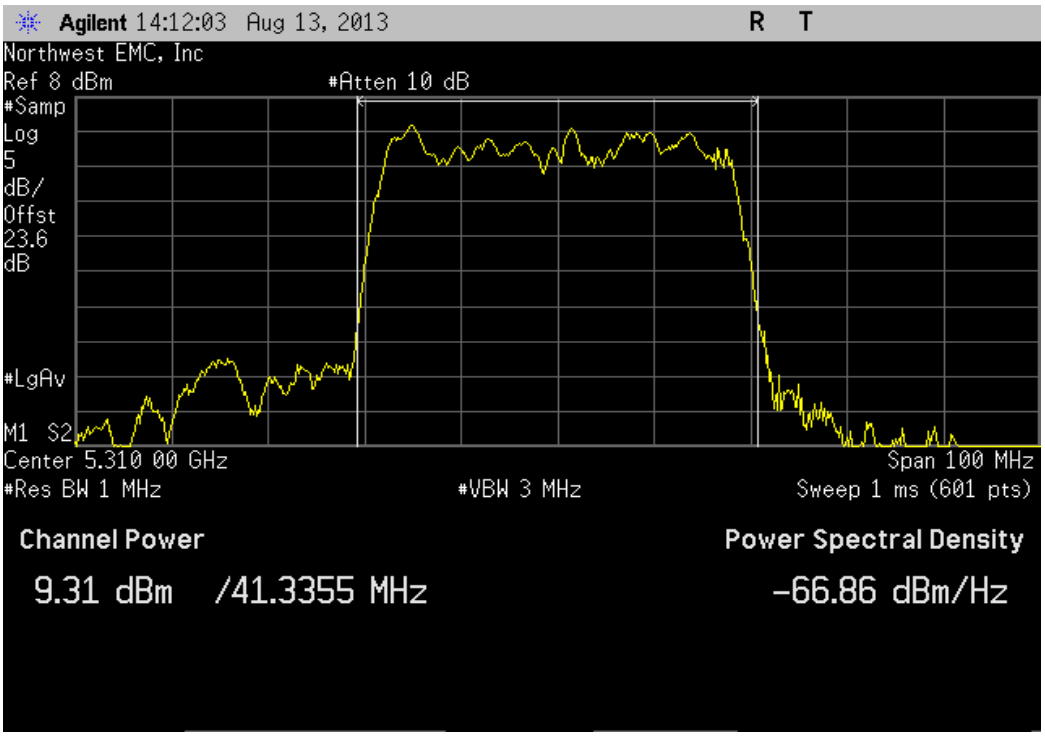
				Value	Limit	Result
				10.266 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

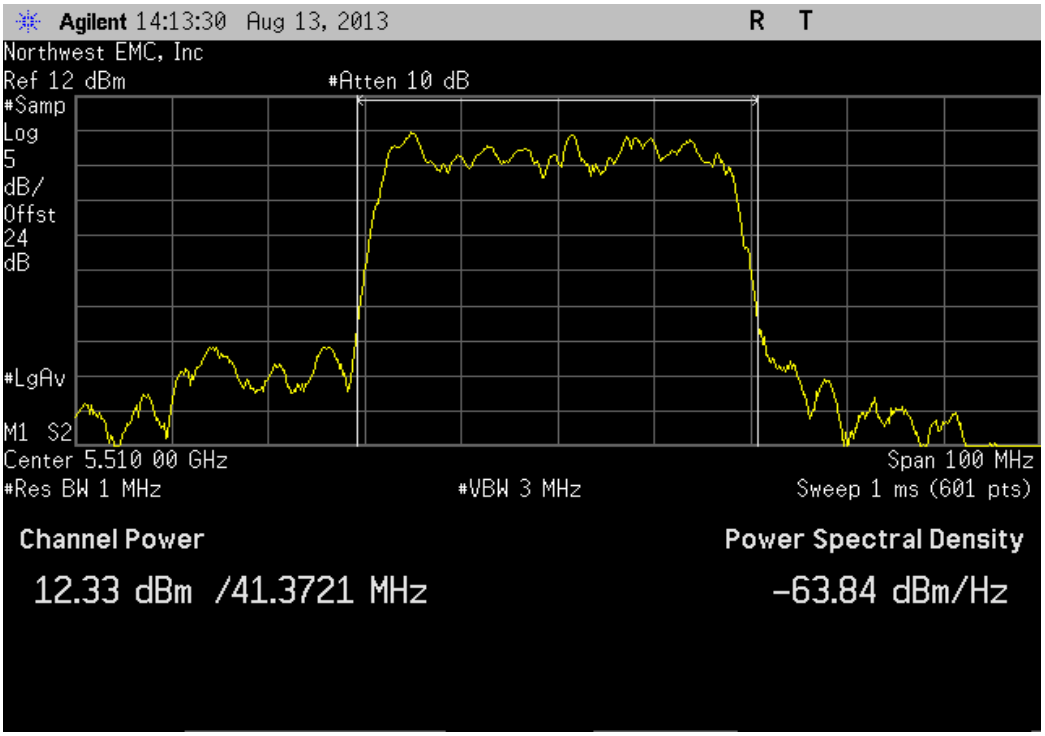
40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				9.307 dBm	< 24 dBm	Pass



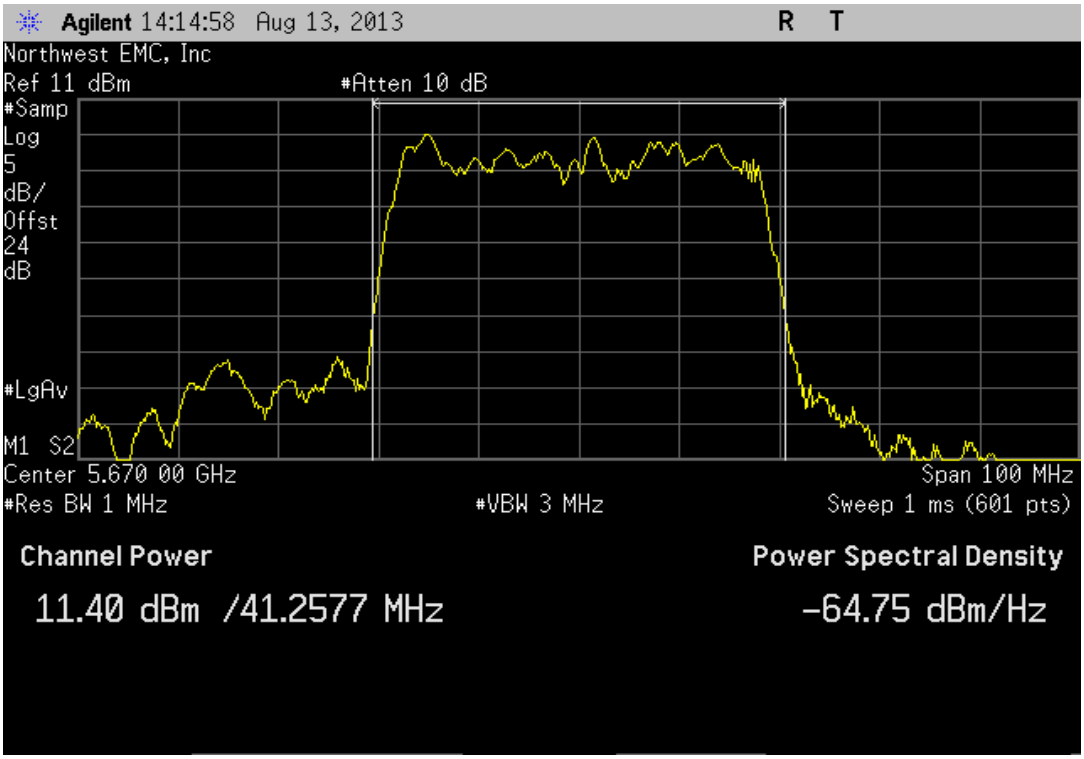
40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				12.33 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna A

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz						
				Value	Limit	Result
				11.4 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

- RBW = 1 MHz, VBW = 3 MHz
- Sample Detector
- The number of points was set to 601. This satisfied the requirement of being > 2 * span / RBW
- Trace average 100 traces in power averaging mode.
- Power was integrated across “B”, by using the channel power function of the analyzer.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing

Peak Transmit Power - Antenna B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

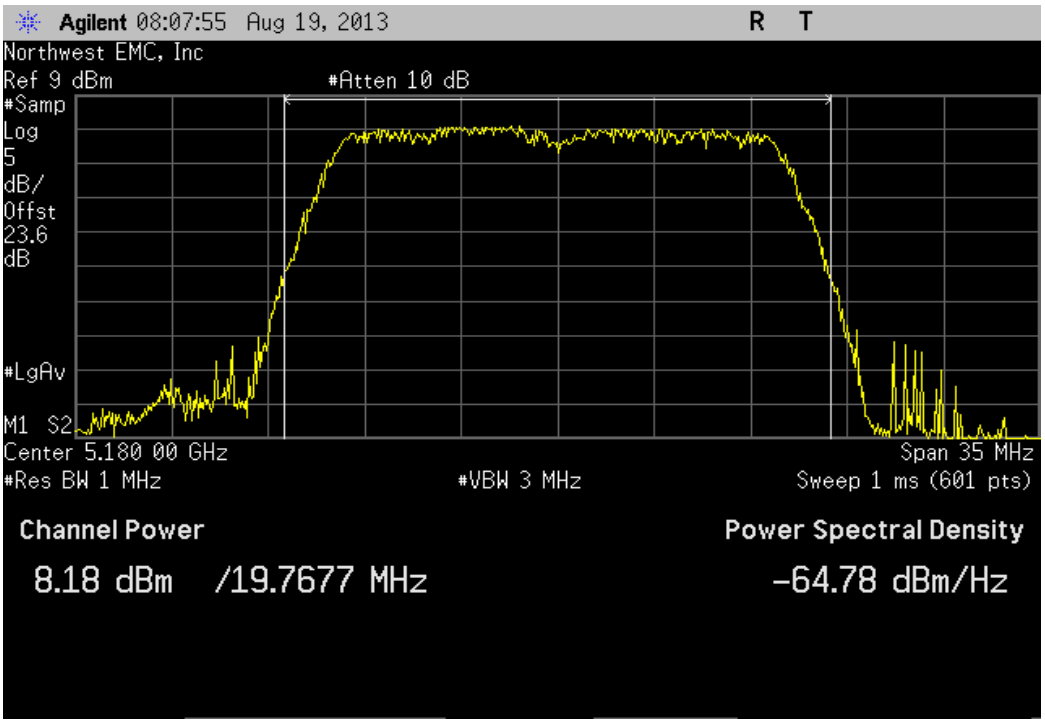
None

Configuration #	1	Signature

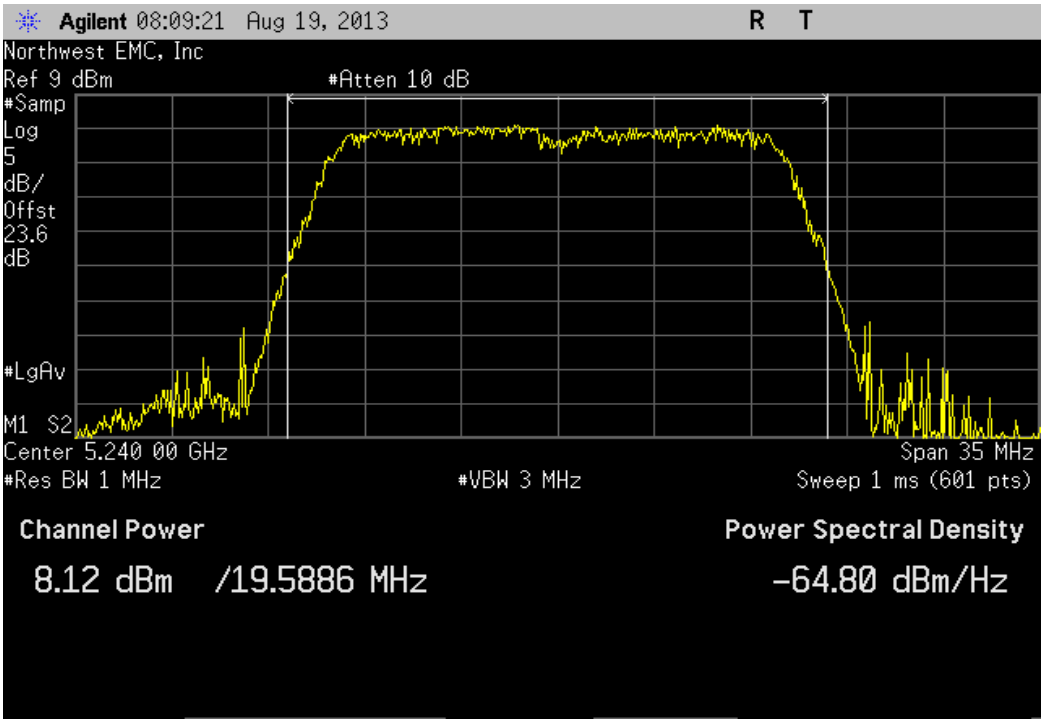
		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	8.181 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	8.122 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	7.654 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	8.711 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	11.797 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.995 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	9.373 dBm	< 24 dBm	Pass
	802.11(a) 36 Mbps			
	Ch 36, Low Channel 5180 MHz	8.436 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	7.953 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	7.561 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	8.638 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	11.687 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.931 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	9.326 dBm	< 24 dBm	Pass
	802.11(a) 54 Mbps			
	Ch 36, Low Channel 5180 MHz	8.443 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	7.955 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	7.612 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	8.68 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	11.746 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.986 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	9.346 dBm	< 24 dBm	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	8.322 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	7.825 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	7.517 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	8.523 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	11.638 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.863 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	9.208 dBm	< 24 dBm	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	8.308 dBm	< 17 dBm	Pass
	Ch 48, High Channel 5240 MHz	7.796 dBm	< 17 dBm	Pass
	Ch 52, Low Channel 5260 MHz	7.509 dBm	< 24 dBm	Pass
	Ch 64, High Channel 5320 MHz	8.492 dBm	< 24 dBm	Pass
	Ch 100, Low Channel 5500 MHz	11.589 dBm	< 24 dBm	Pass
	Ch 116, Mid Channel 5580 MHz	10.835 dBm	< 24 dBm	Pass
	Ch 140, High Channel 5700 MHz	9.205 dBm	< 24 dBm	Pass
40 MHz				
	802.11(n) MCS0			
	Ch 36/40, Low Channel 5190 MHz	6.242 dBm	< 17 dBm	Pass
	Ch 44/48, High Channel 5230 MHz	8.469 dBm	< 17 dBm	Pass
	Ch 52/56, Low Channel 5270 MHz	8.119 dBm	< 24 dBm	Pass
	Ch 60/64, High Channel 5310 MHz	7.306 dBm	< 24 dBm	Pass
	Ch 100/104, Low Channel 5510 MHz	10.186 dBm	< 24 dBm	Pass
	Ch 132/136, High Channel 5670 MHz	8.136 dBm	< 24 dBm	Pass
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	7.184 dBm	< 17 dBm	Pass
	Ch 44/48, High Channel 5230 MHz	9.395 dBm	< 17 dBm	Pass
	Ch 52/56, Low Channel 5270 MHz	9.024 dBm	< 24 dBm	Pass
	Ch 60/64, High Channel 5310 MHz	8.198 dBm	< 24 dBm	Pass
	Ch 100/104, Low Channel 5510 MHz	11.065 dBm	< 24 dBm	Pass
	Ch 132/136, High Channel 5670 MHz	9.088 dBm	< 24 dBm	Pass

Peak Transmit Power - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				8.181 dBm	< 17 dBm	Pass

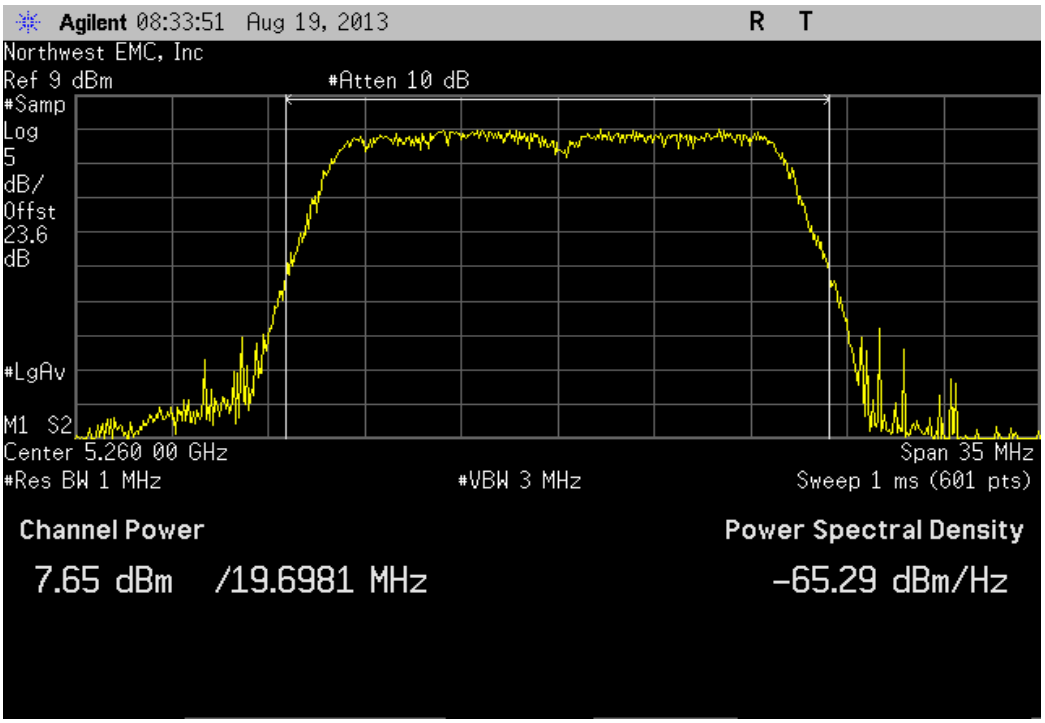


20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				8.122 dBm	< 17 dBm	Pass

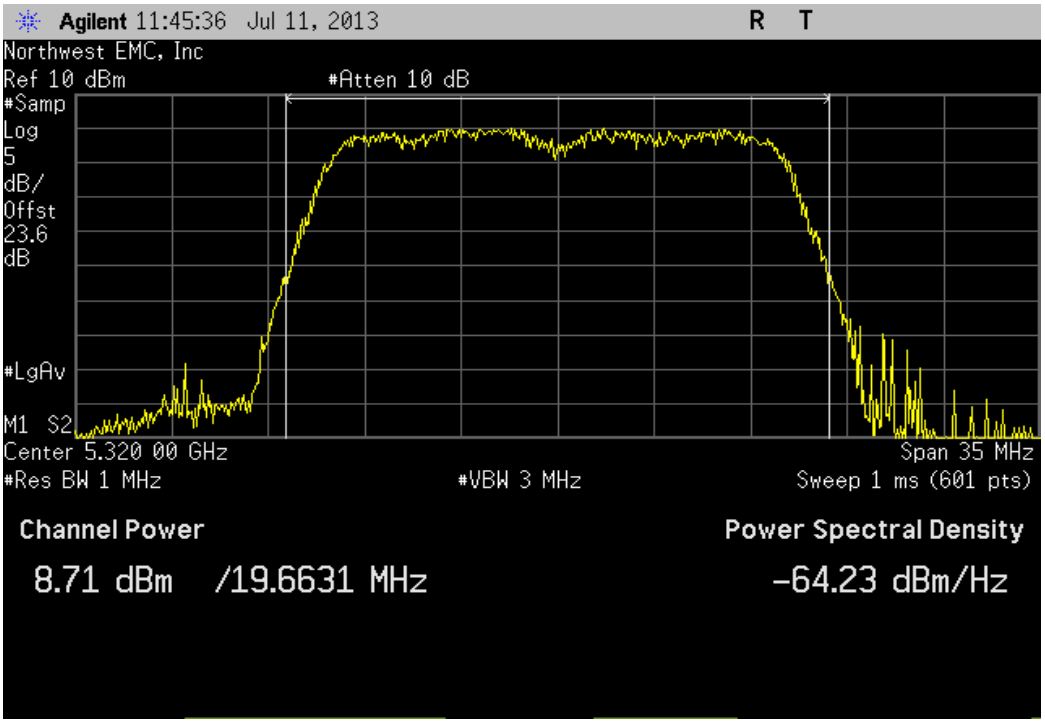


Peak Transmit Power - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				7.654 dBm	< 24 dBm	Pass



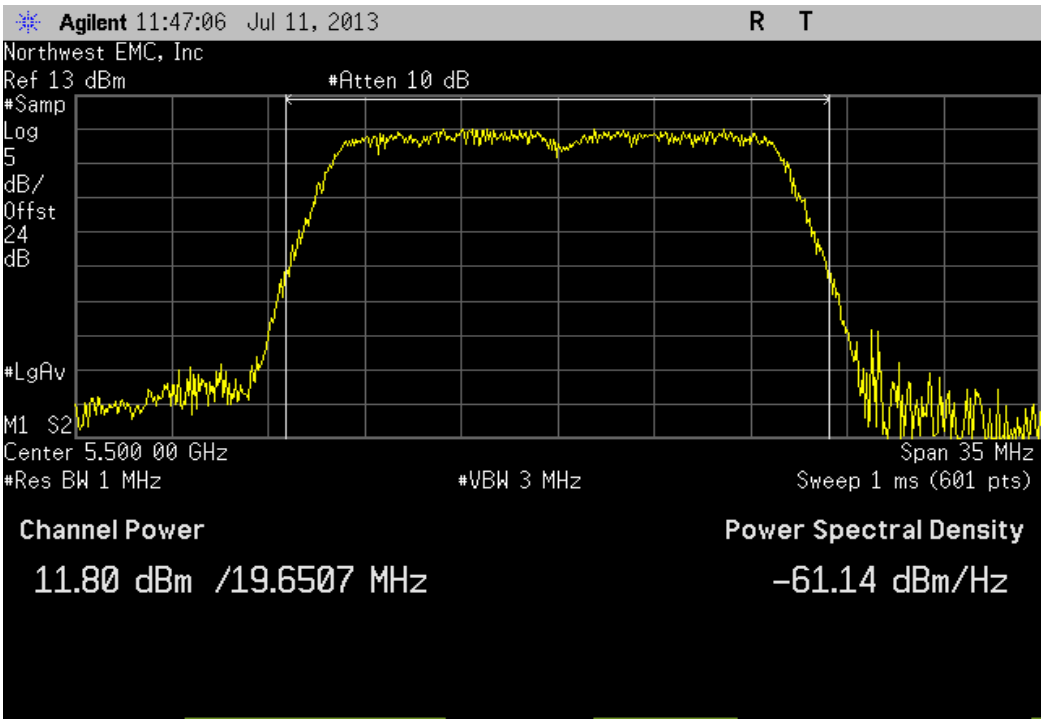
20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				8.711 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

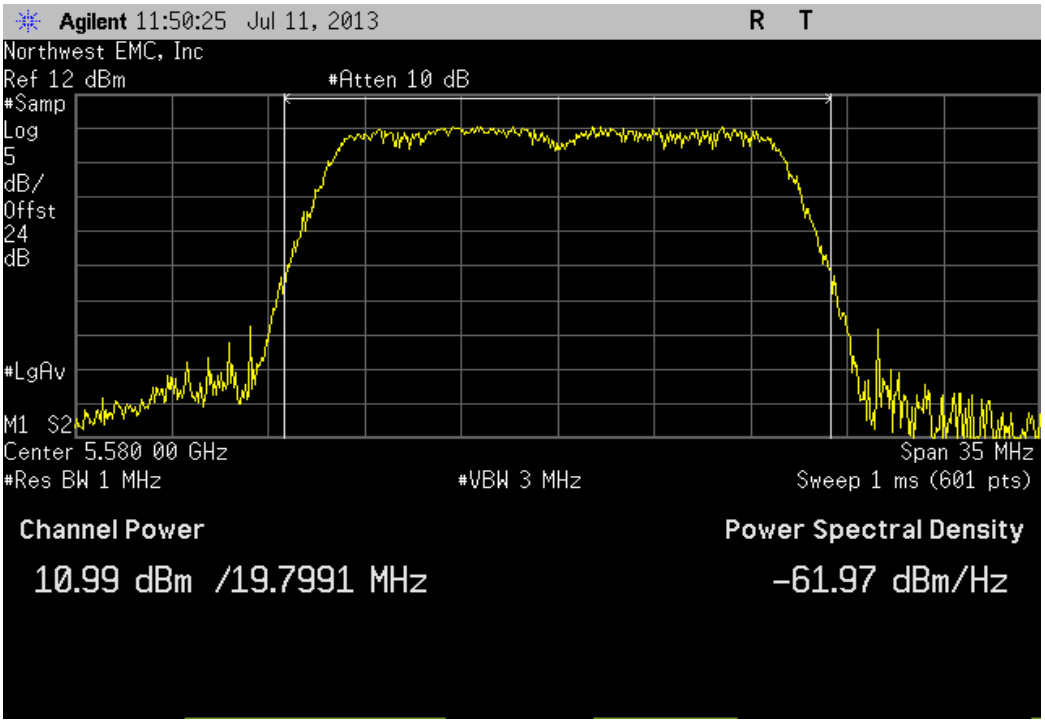
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				11.797 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

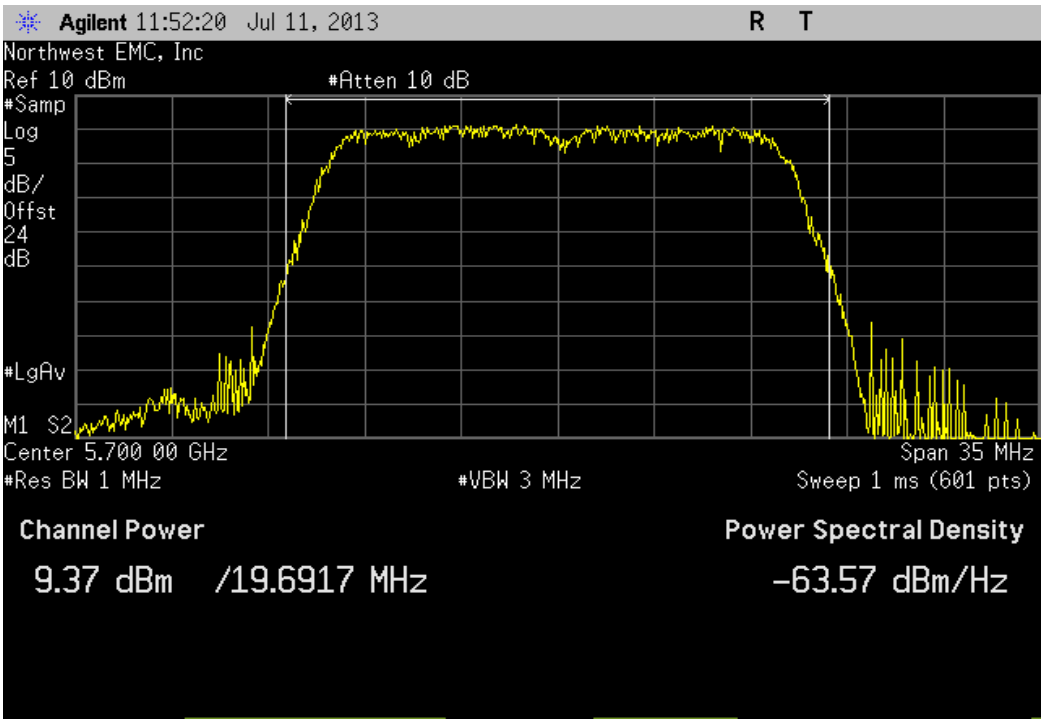
				Value	Limit	Result
				10.995 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

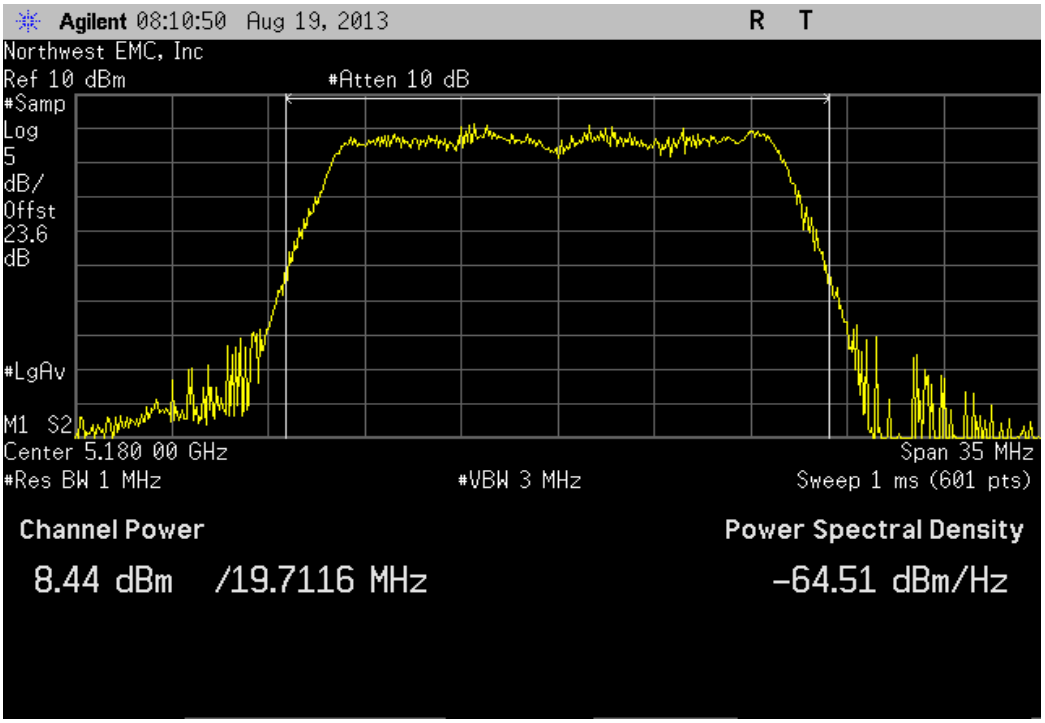
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				9.373 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

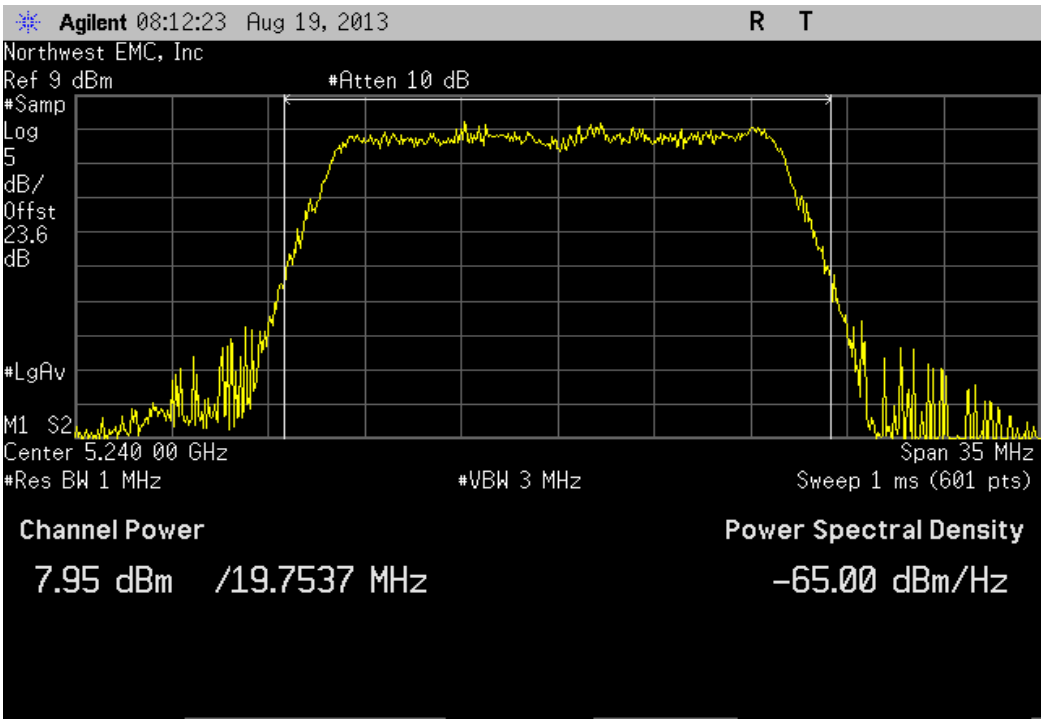
				Value	Limit	Result
				8.436 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna B

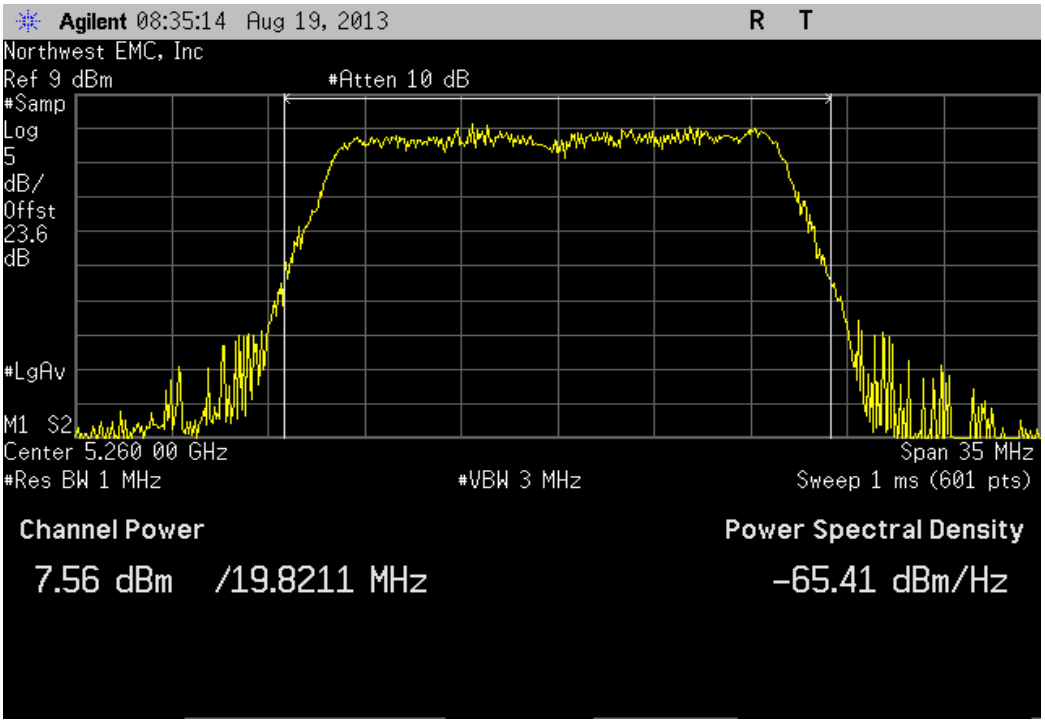
20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				7.953 dBm	< 17 dBm	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz

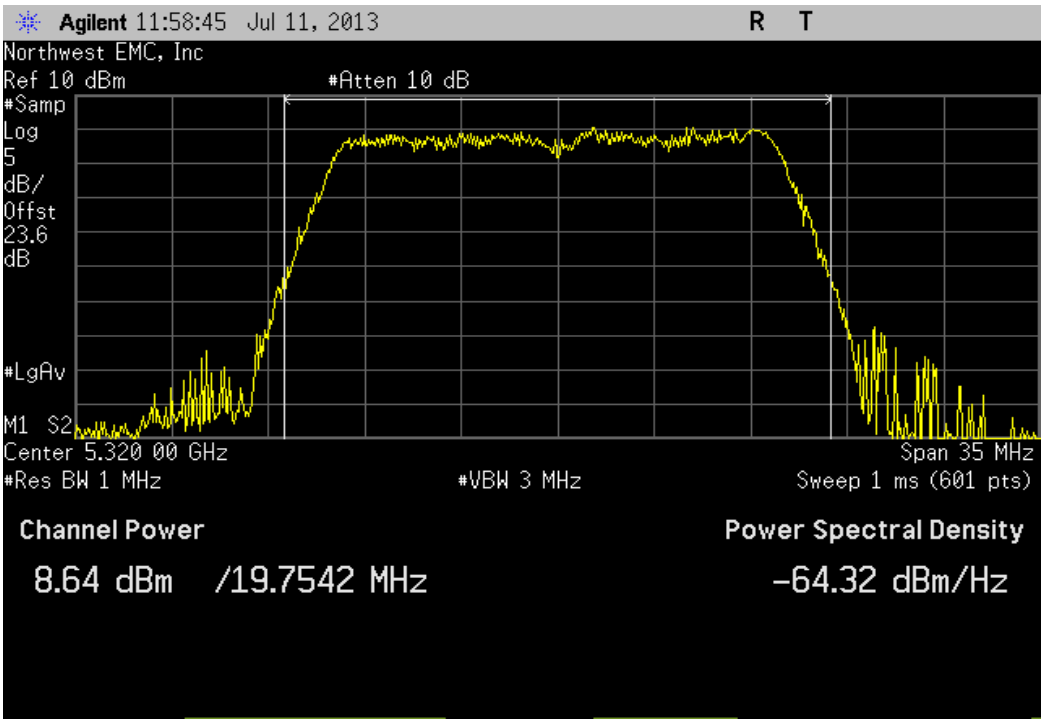
				Value	Limit	Result
				7.561 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

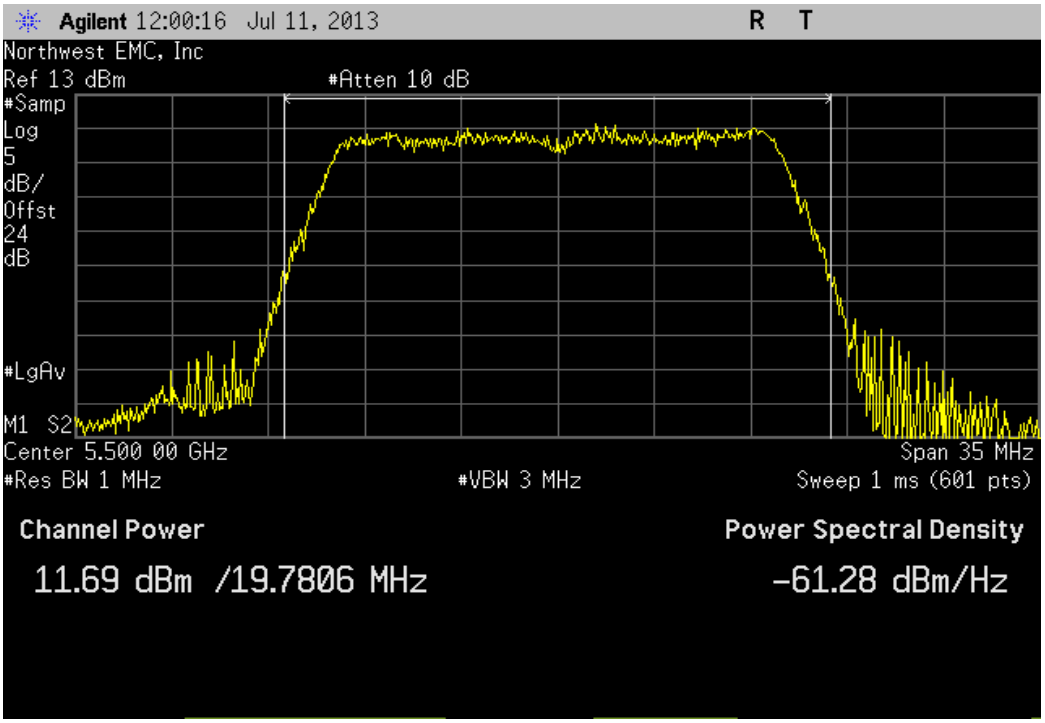
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				8.638 dBm	< 24 dBm	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

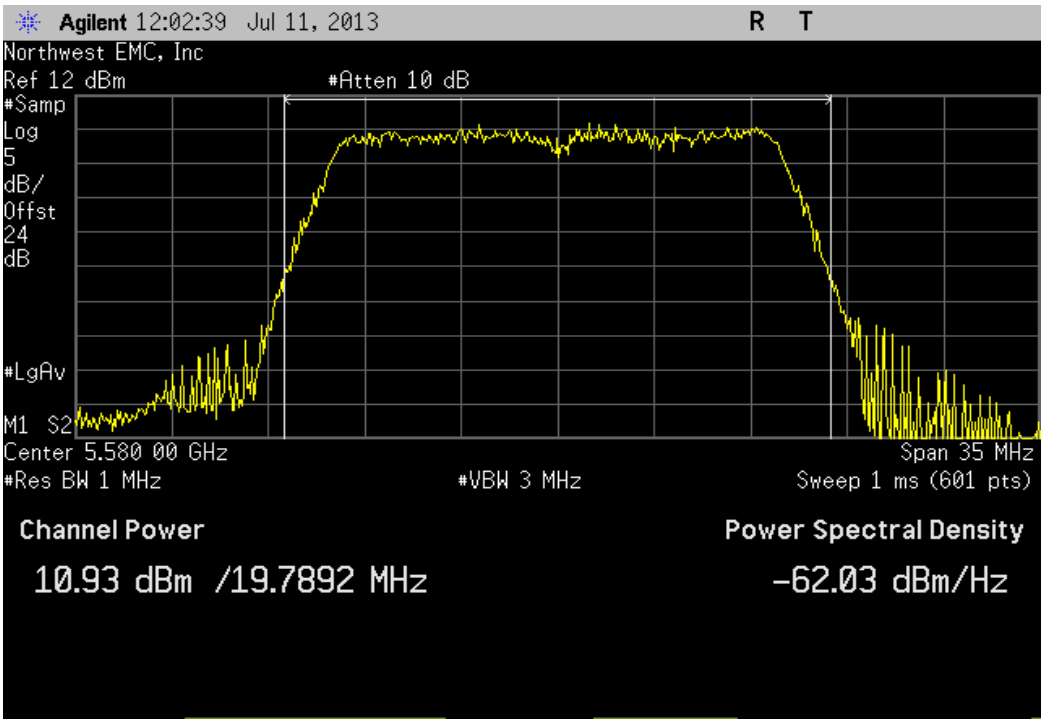
				Value	Limit	Result
				11.687 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

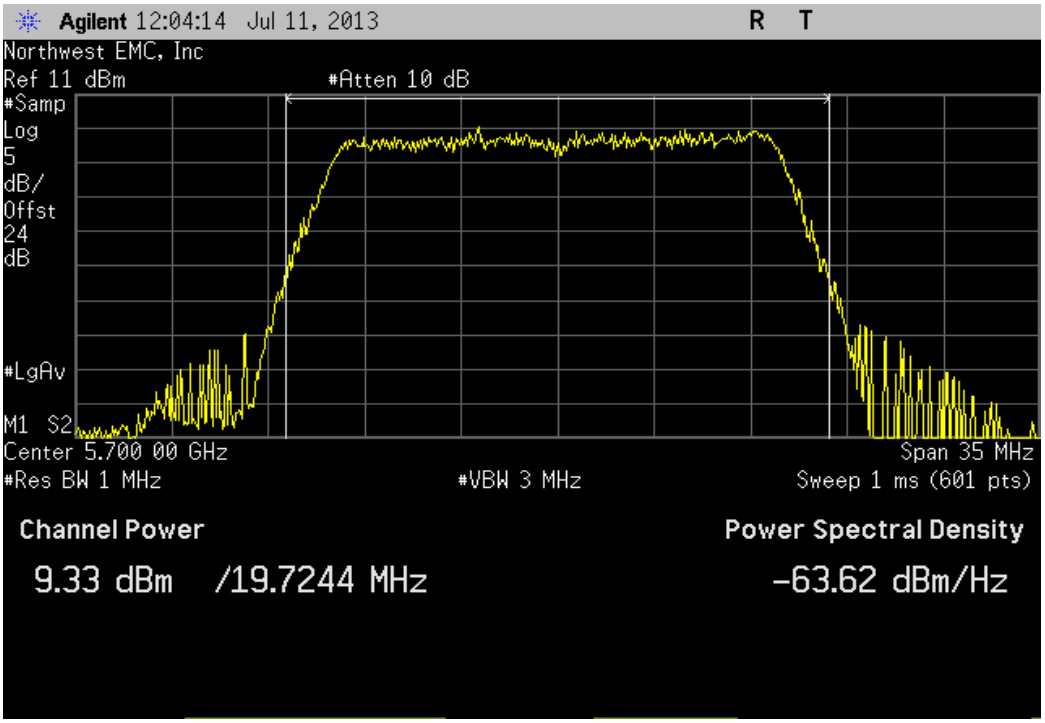
20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				10.931 dBm	< 24 dBm	Pass



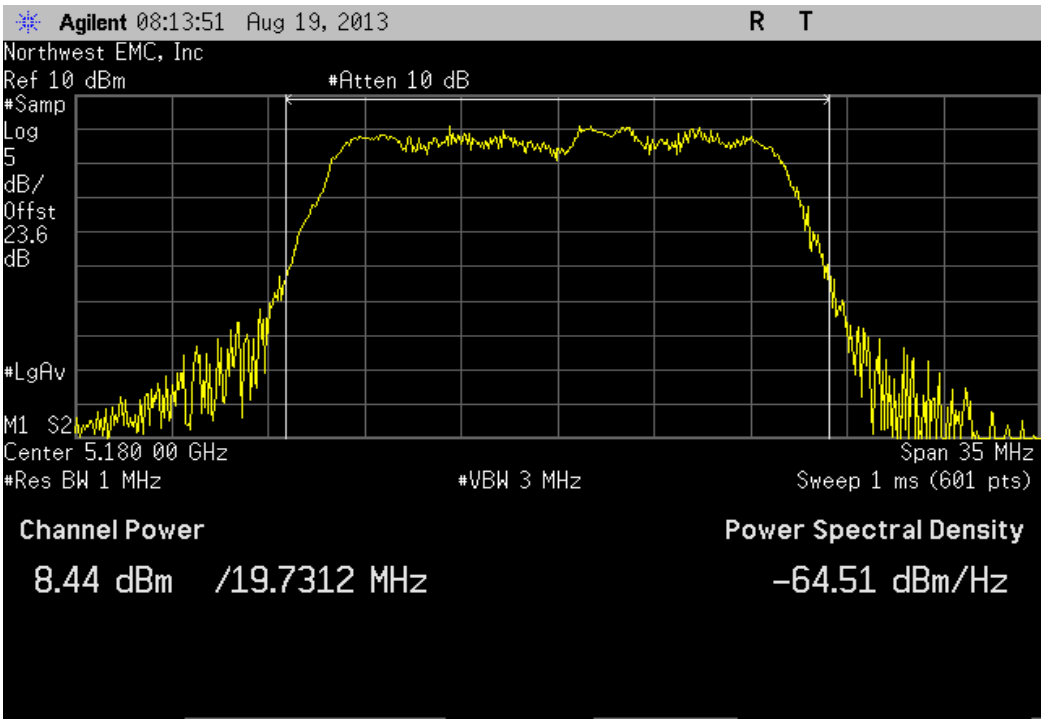
20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				9.326 dBm	< 24 dBm	Pass

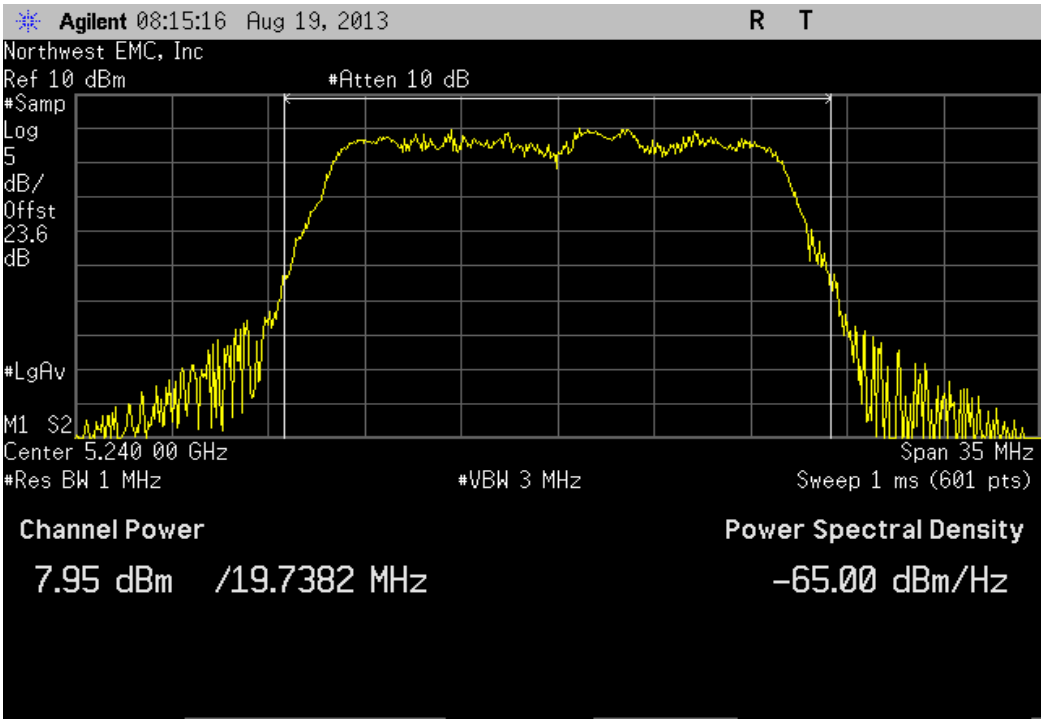


Peak Transmit Power - Antenna B

20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				8.443 dBm	< 17 dBm	Pass



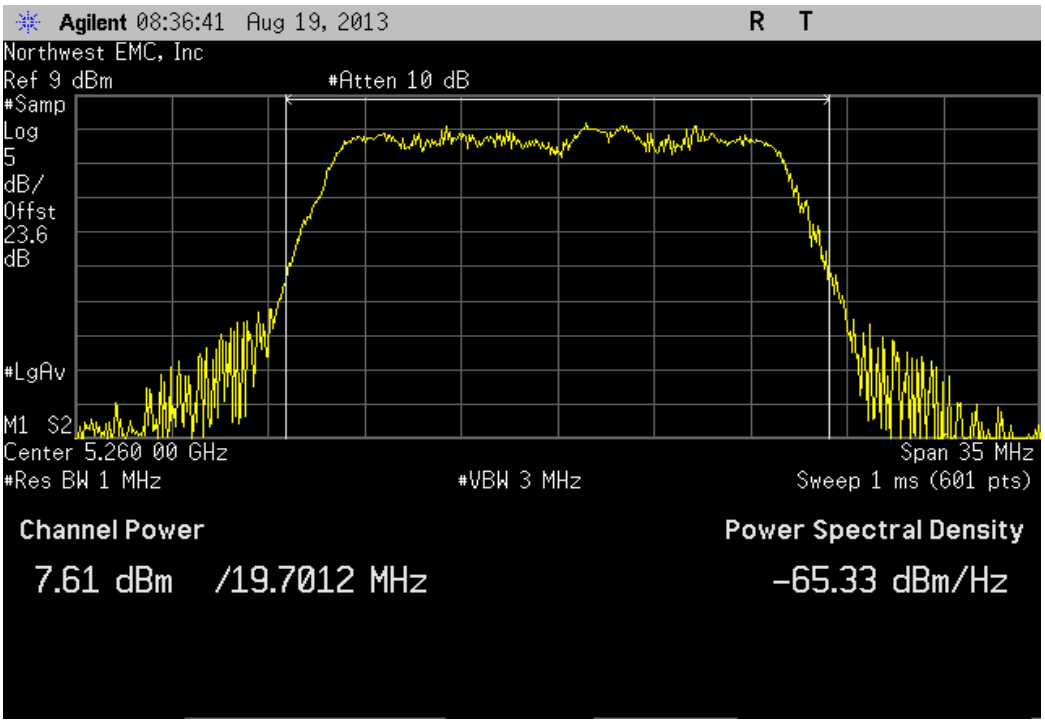
20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				7.955 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna B

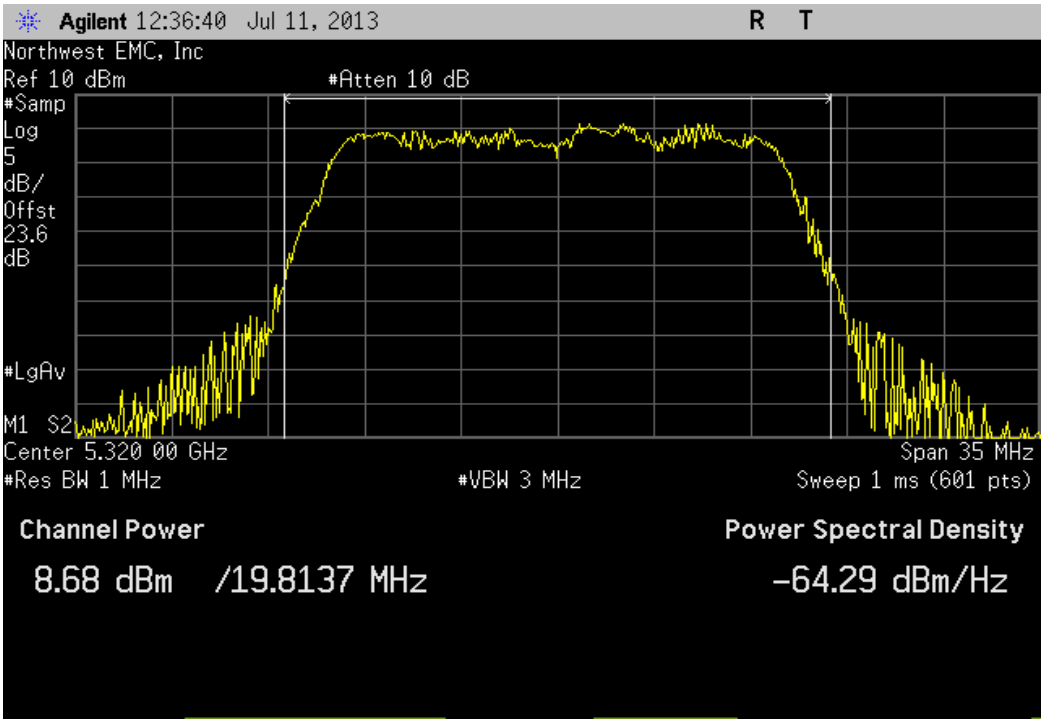
20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				7.612 dBm	< 24 dBm	Pass



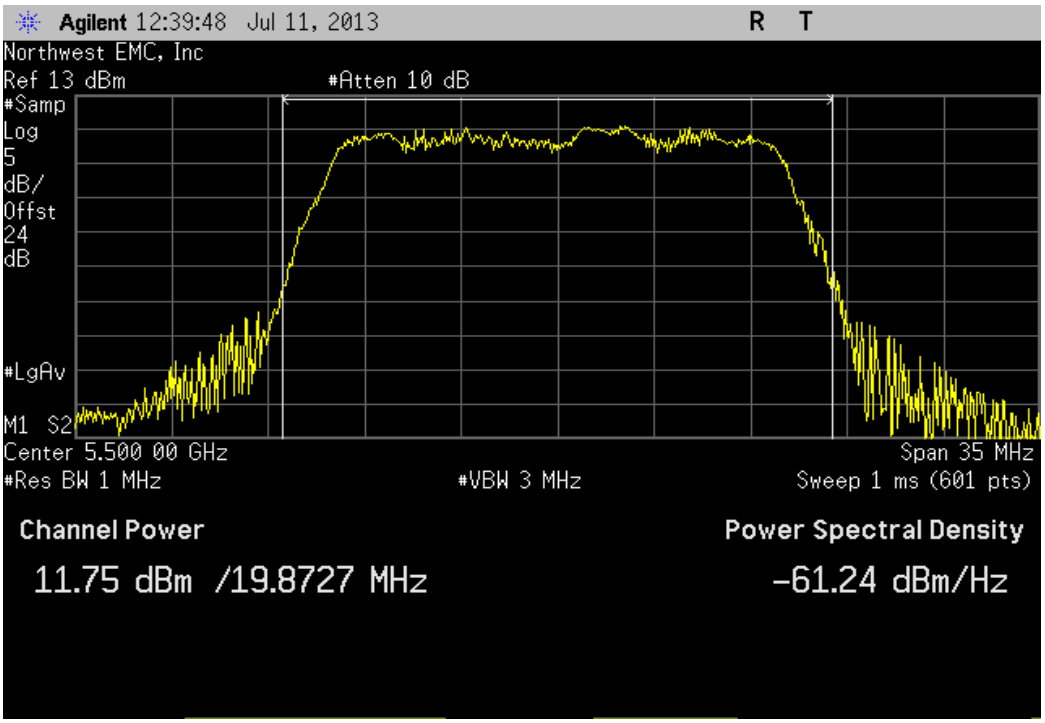
20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				8.68 dBm	< 24 dBm	Pass

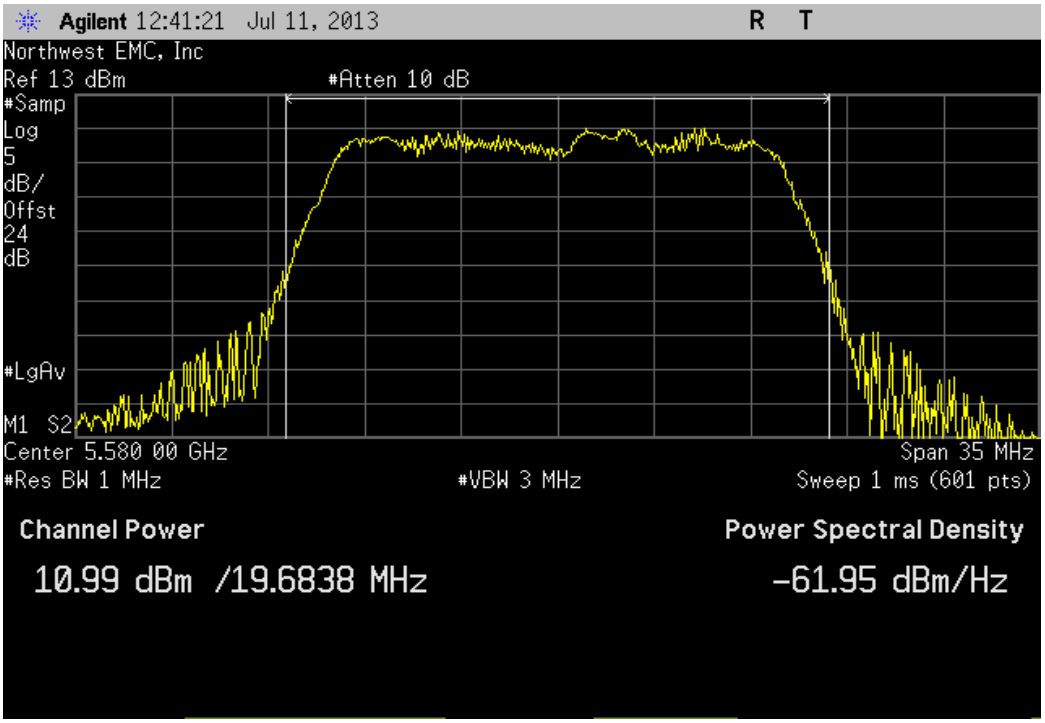


Peak Transmit Power - Antenna B

20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				11.746 dBm	< 24 dBm	Pass

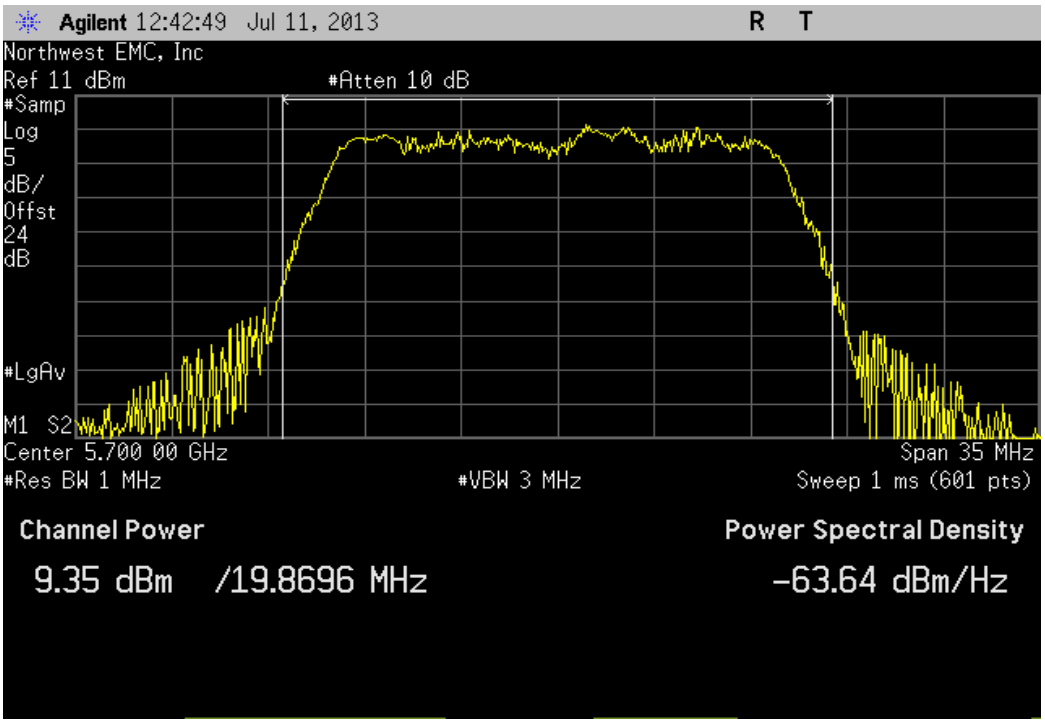


20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				10.986 dBm	< 24 dBm	Pass

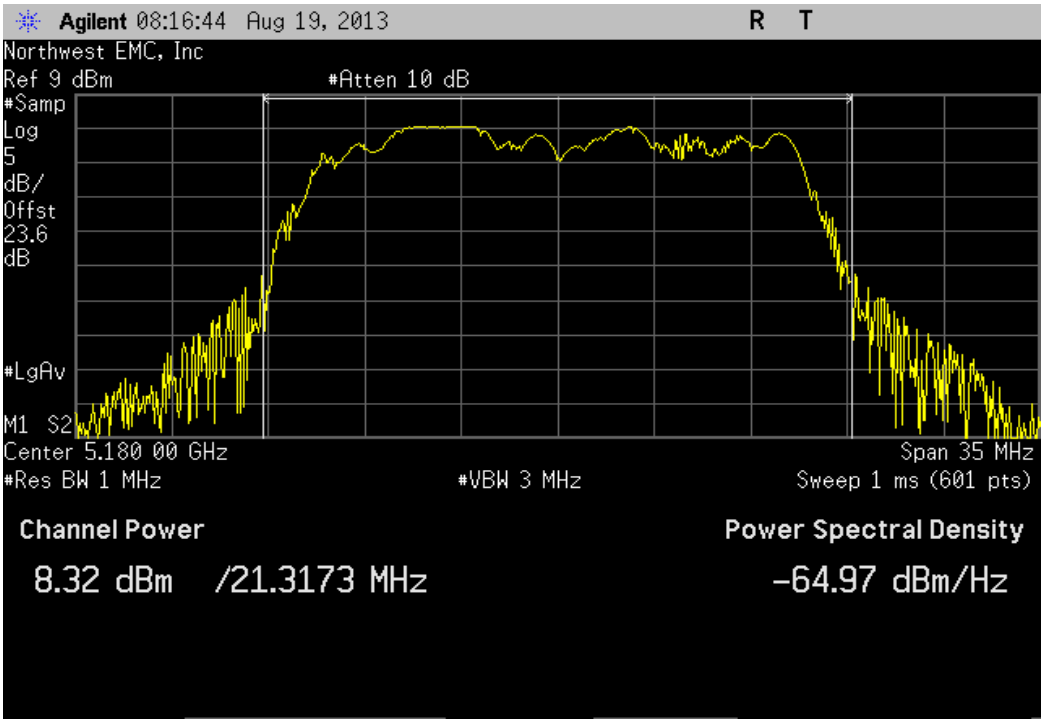


Peak Transmit Power - Antenna B

20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				9.346 dBm	< 24 dBm	Pass

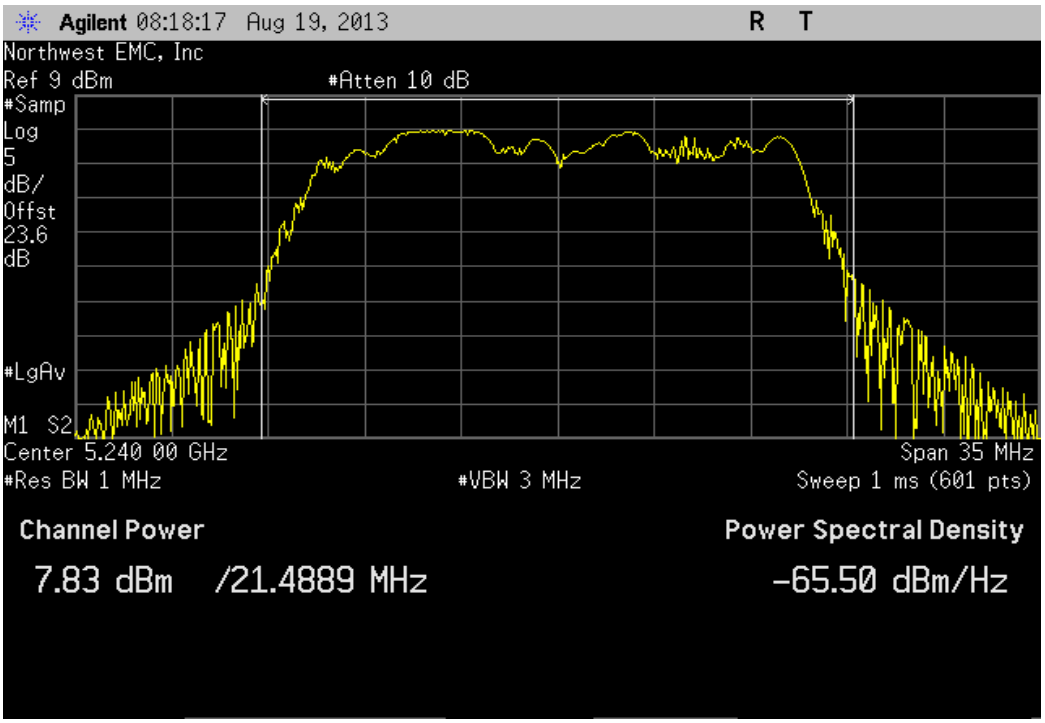


20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				8.322 dBm	< 17 dBm	Pass

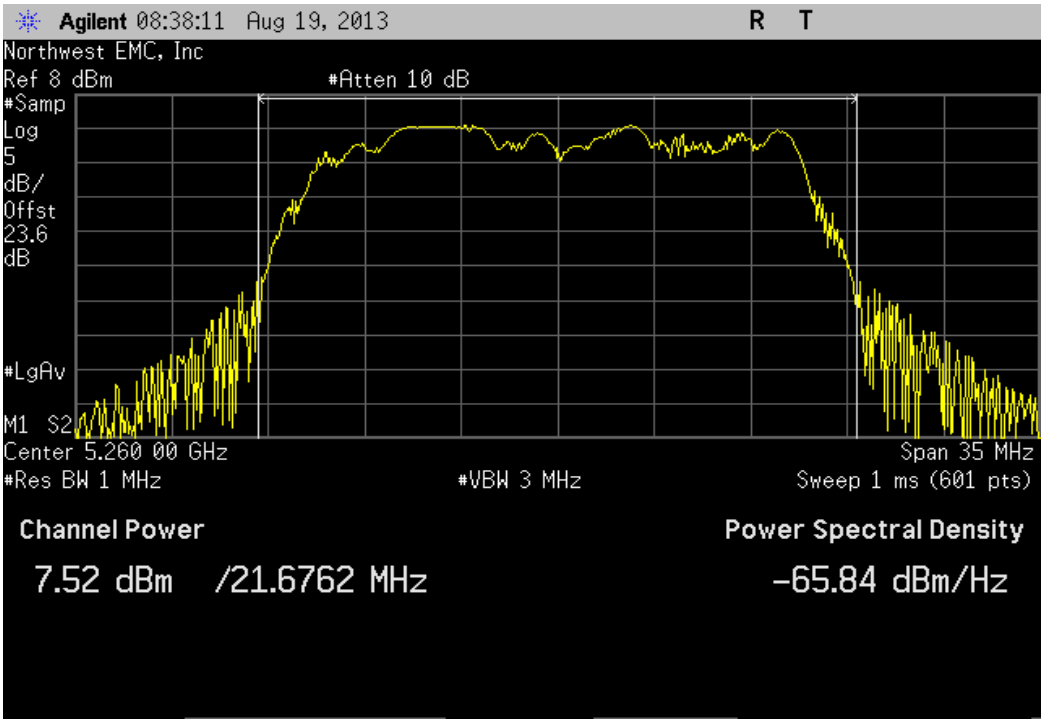


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				7.825 dBm	< 17 dBm	Pass

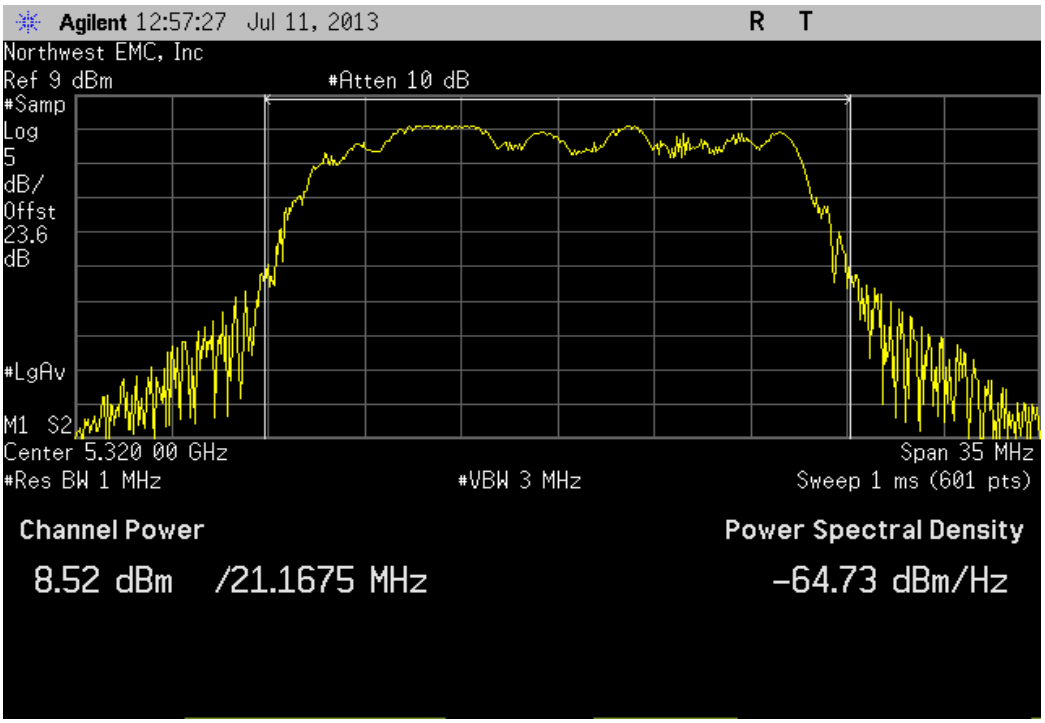


20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				7.517 dBm	< 24 dBm	Pass

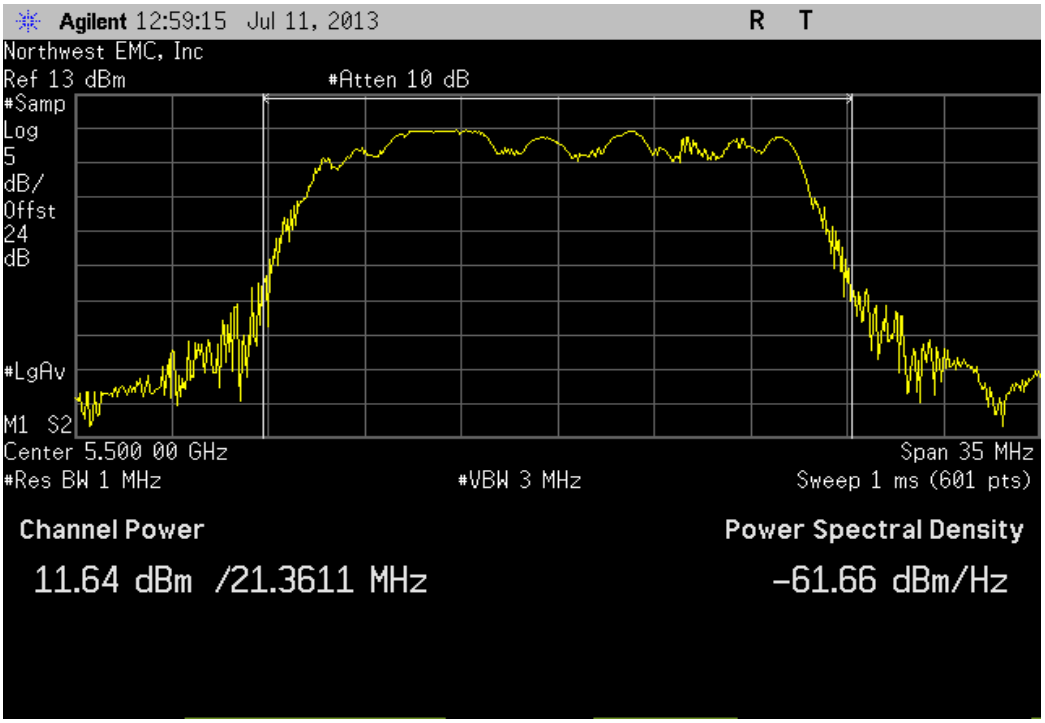


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				8.523 dBm	< 24 dBm	Pass

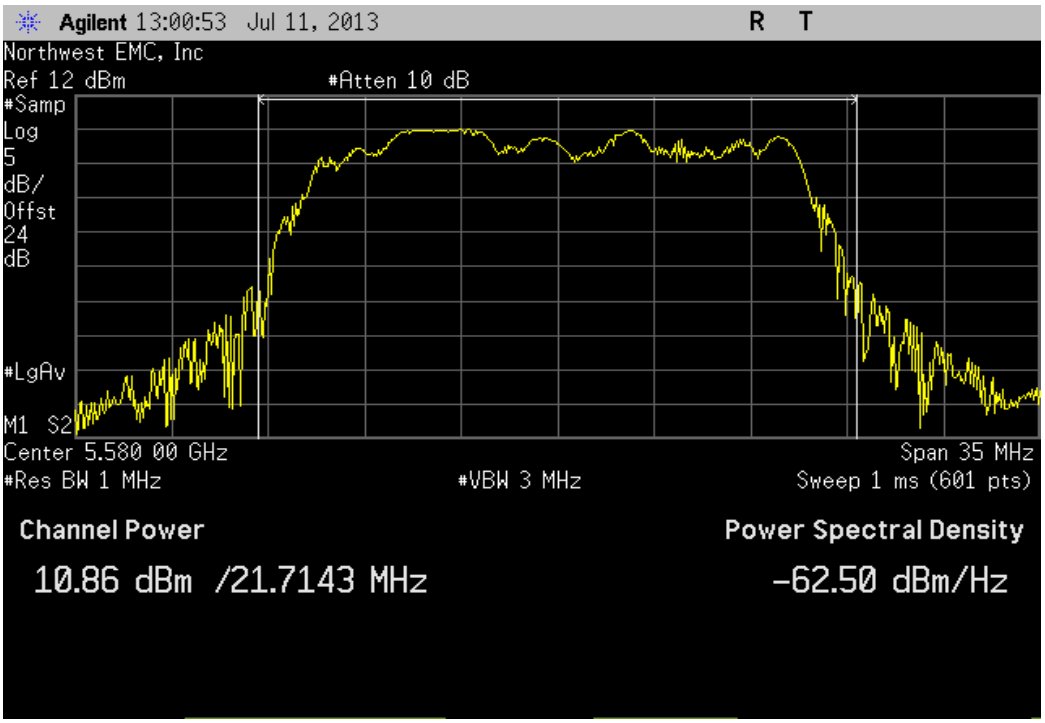


20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				11.638 dBm	< 24 dBm	Pass

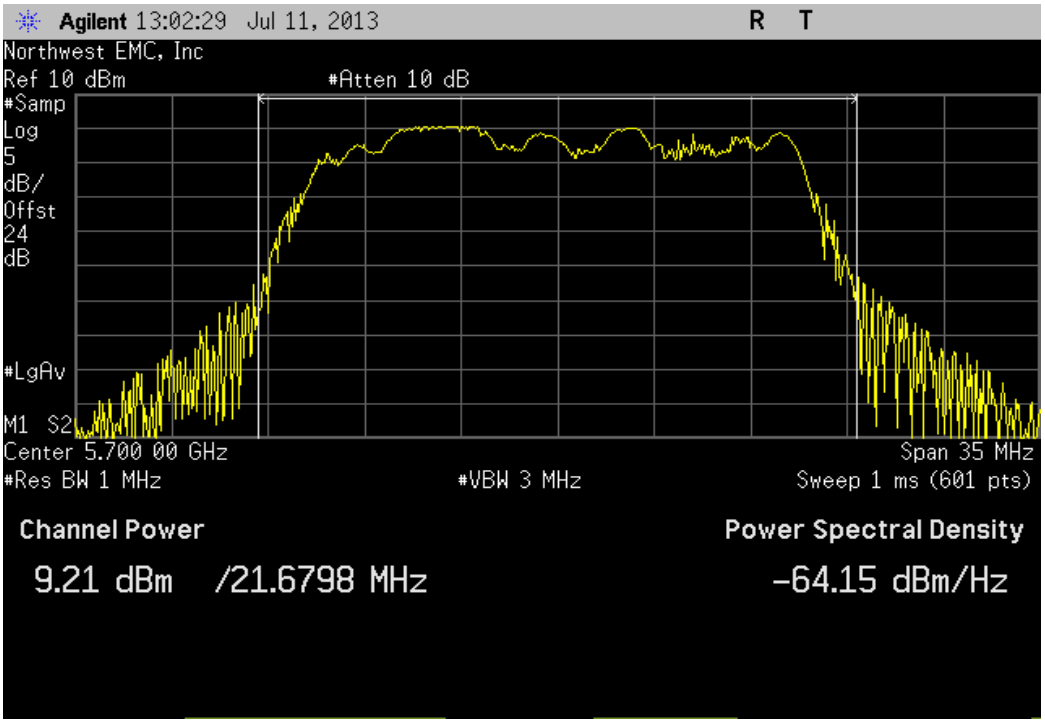


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				10.863 dBm	< 24 dBm	Pass

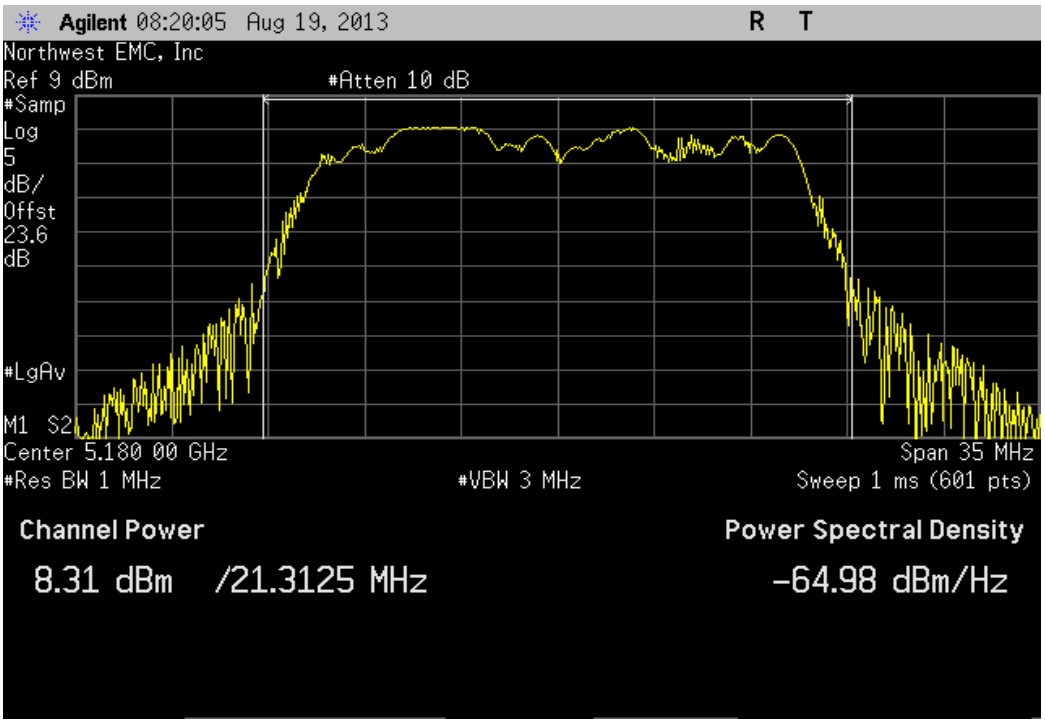


20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				9.208 dBm	< 24 dBm	Pass

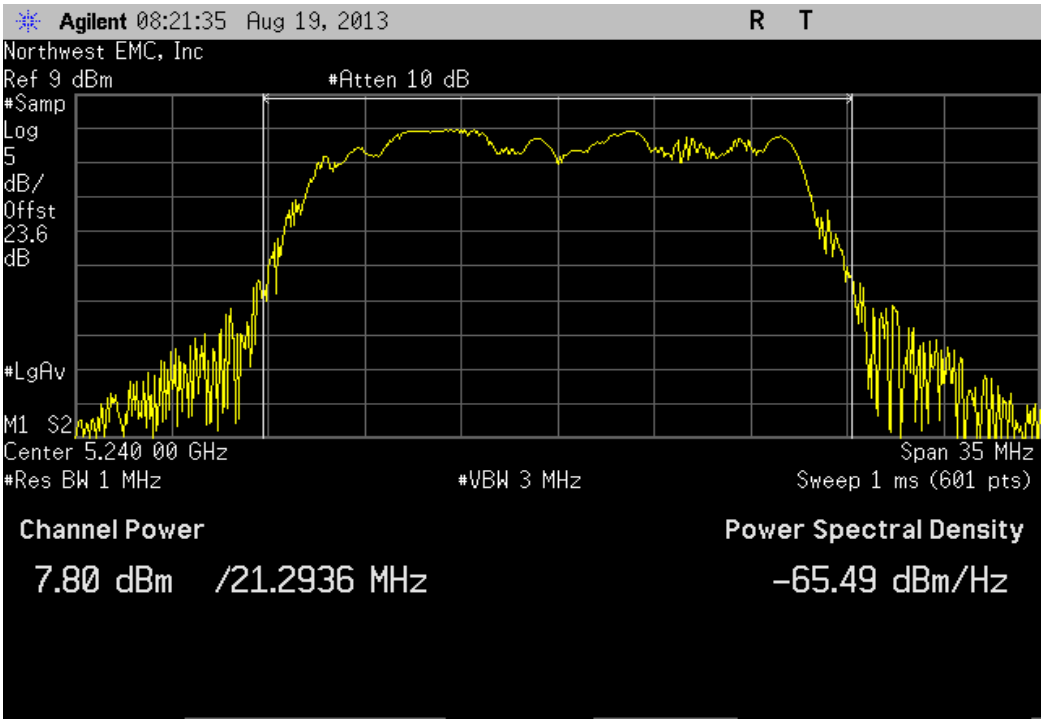


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				8.308 dBm	< 17 dBm	Pass

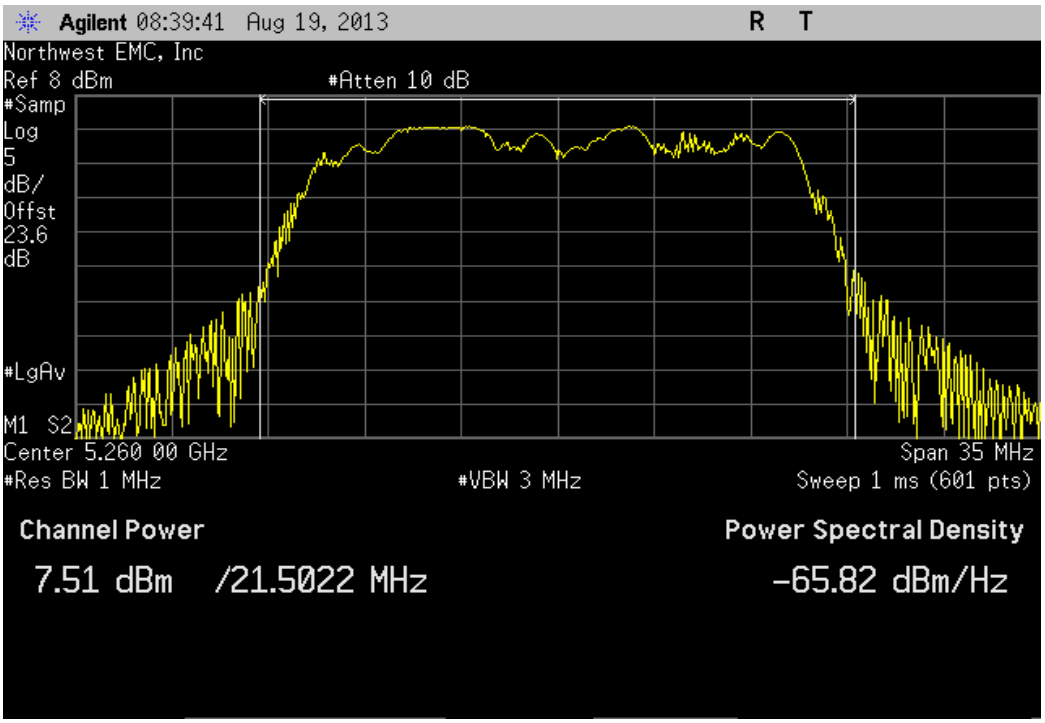


20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				7.796 dBm	< 17 dBm	Pass

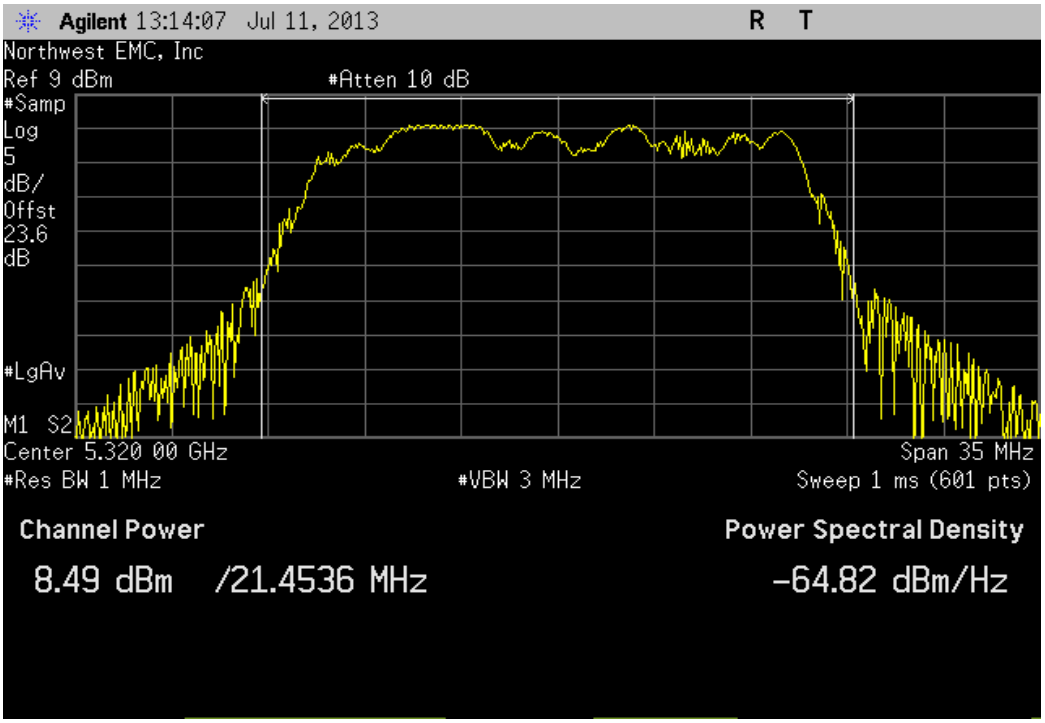


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				7.509 dBm	< 24 dBm	Pass

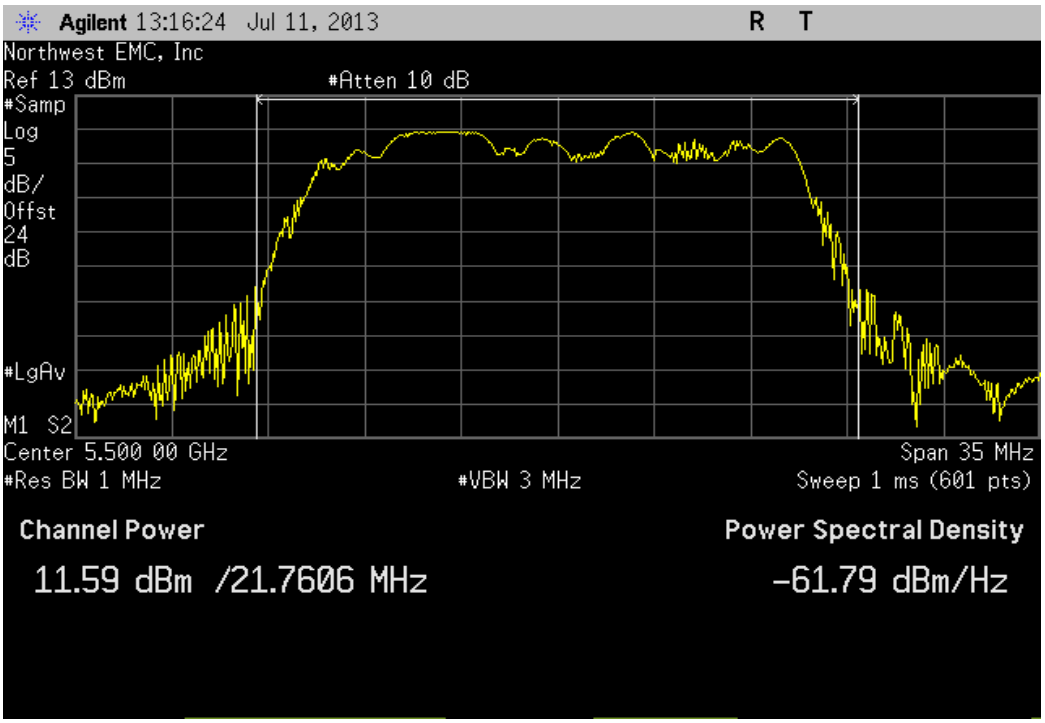


20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				8.492 dBm	< 24 dBm	Pass

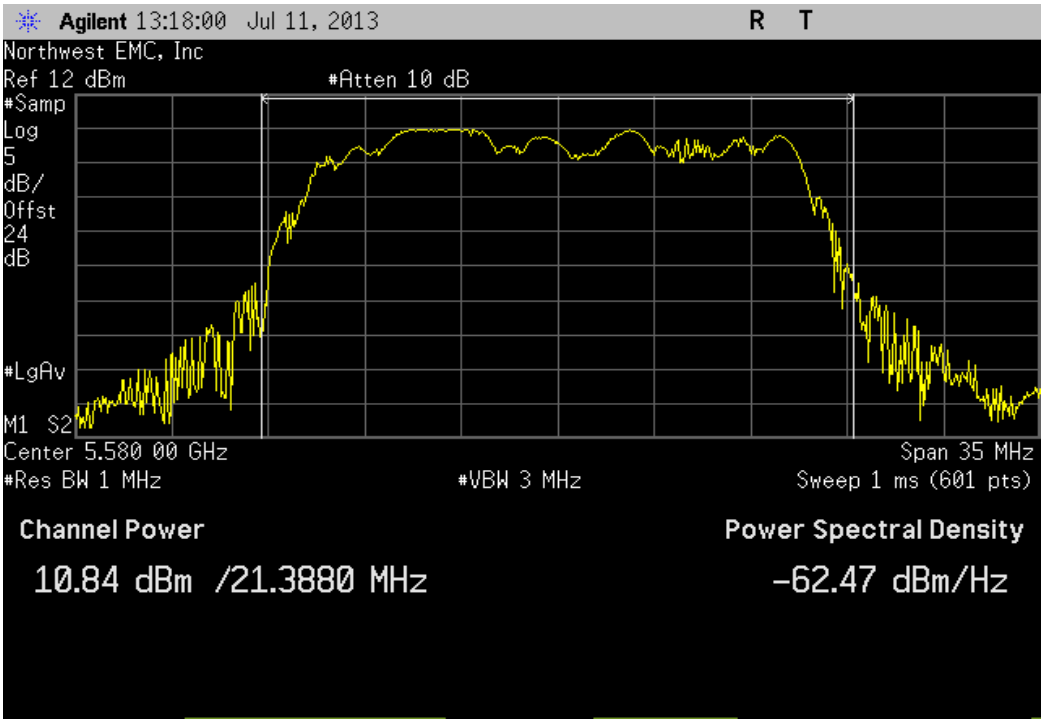


Peak Transmit Power - Antenna B

20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				11.589 dBm	< 24 dBm	Pass



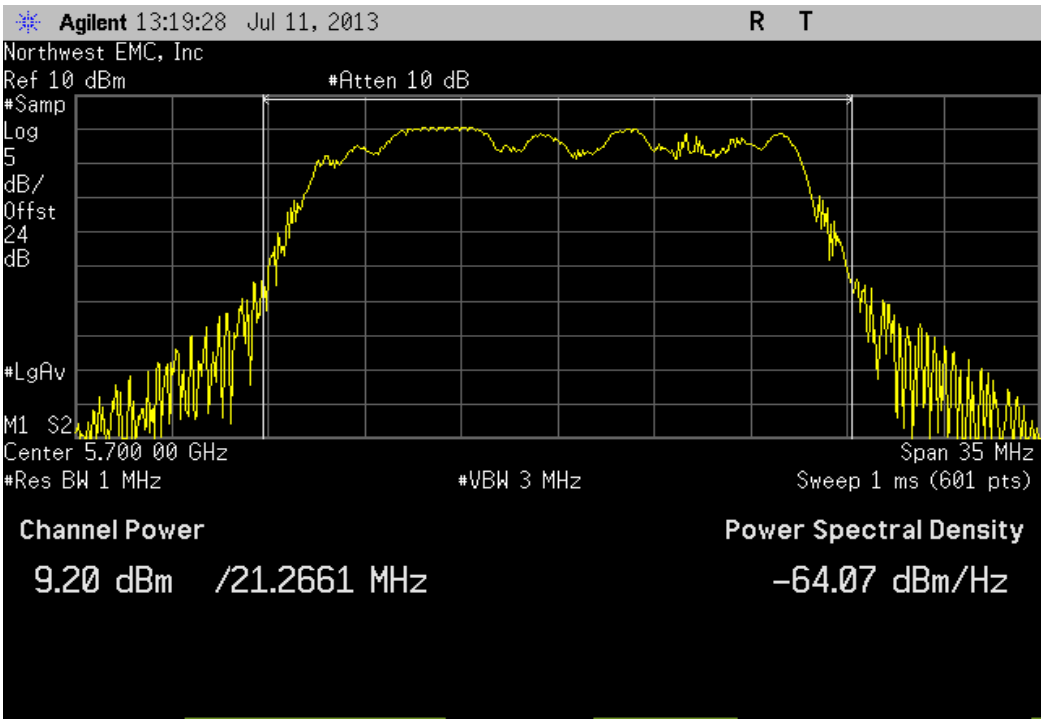
20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				10.835 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

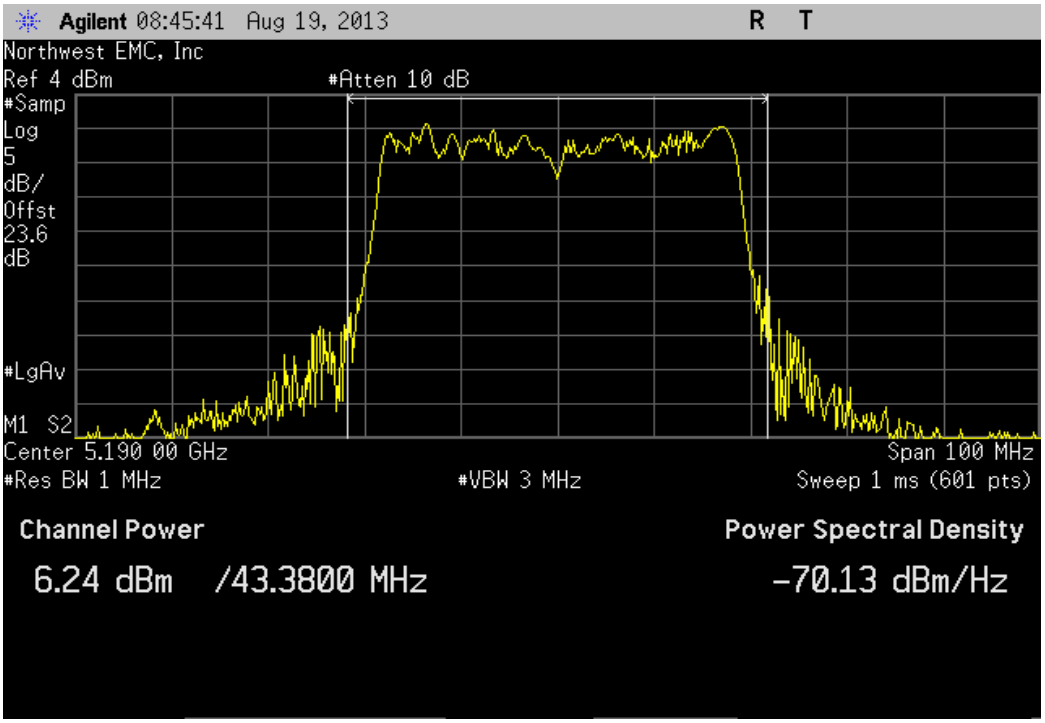
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				9.205 dBm	< 24 dBm	Pass



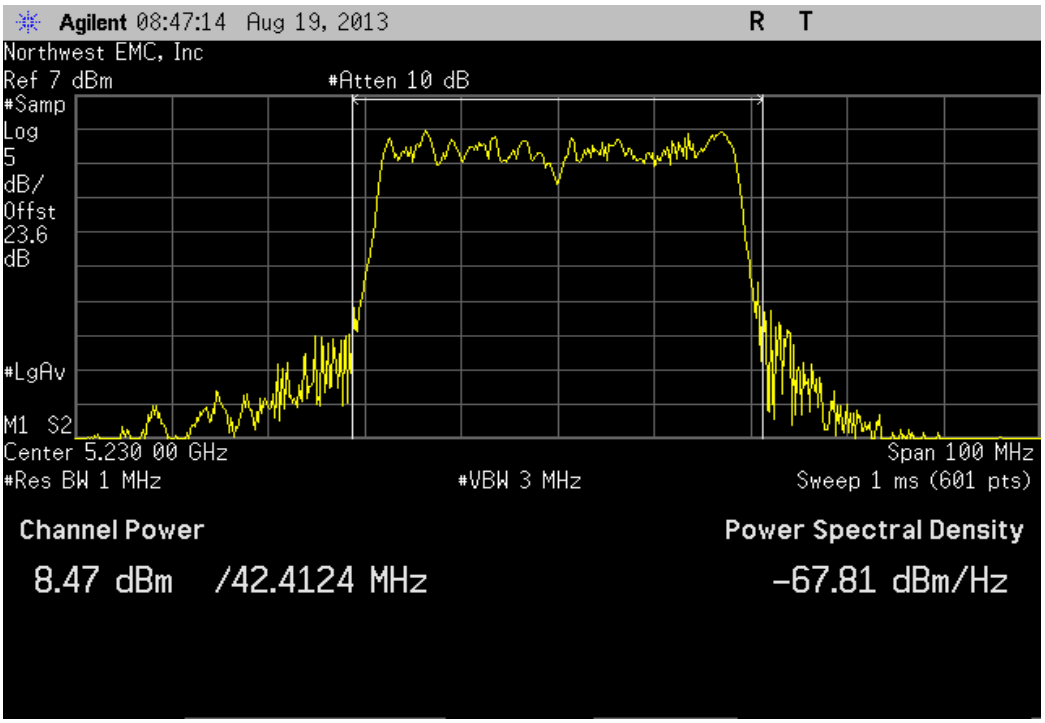
40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				6.242 dBm	< 17 dBm	Pass

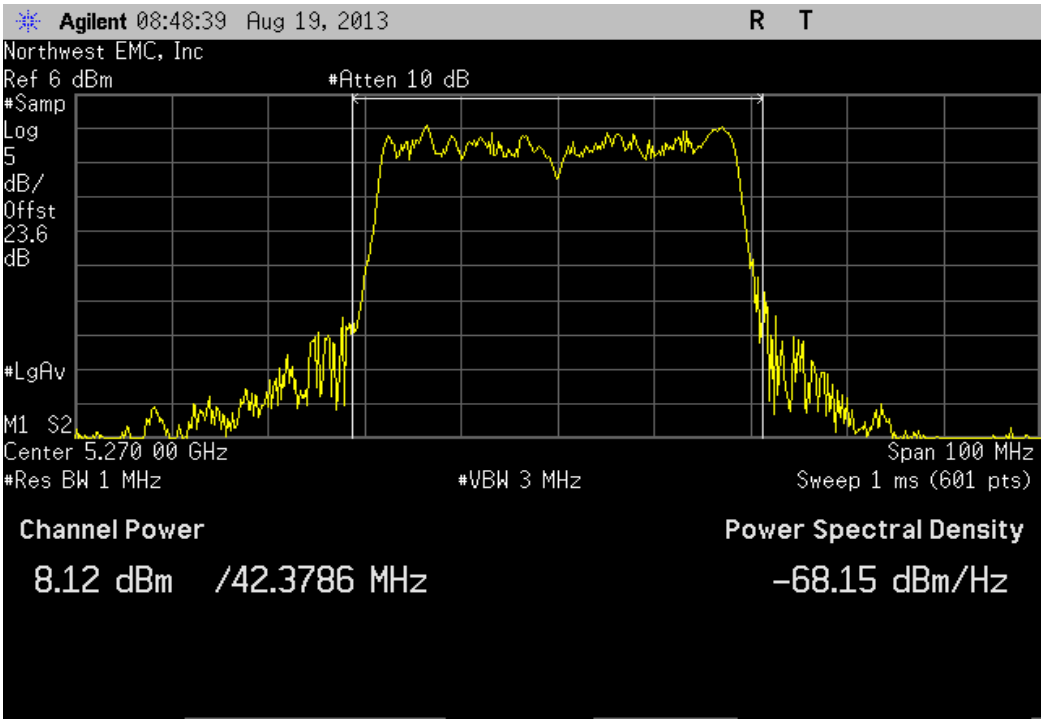


Peak Transmit Power - Antenna B

40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz						
				Value	Limit	Result
				8.469 dBm	< 17 dBm	Pass

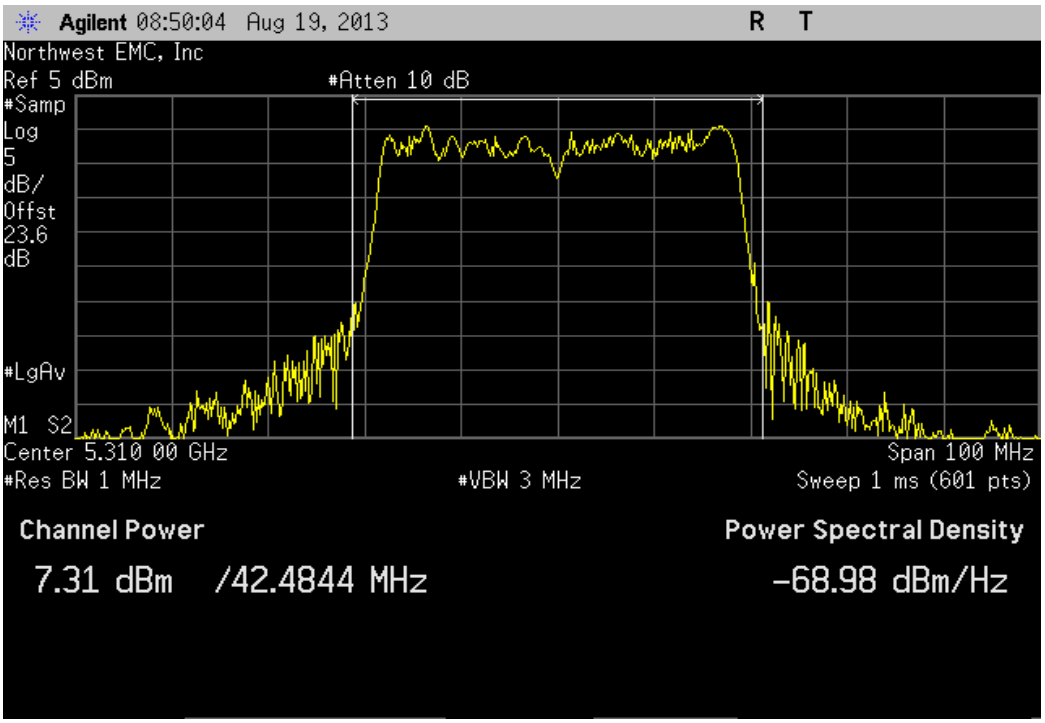


40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	Result
				8.119 dBm	< 24 dBm	Pass

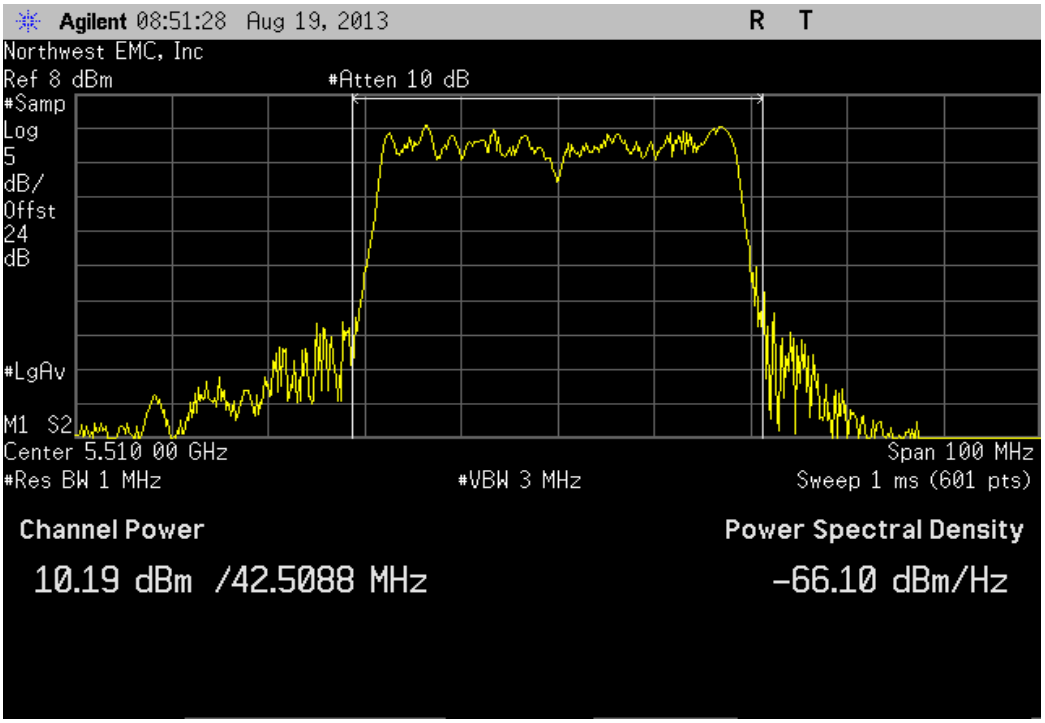


Peak Transmit Power - Antenna B

40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	Result
				7.306 dBm	< 24 dBm	Pass



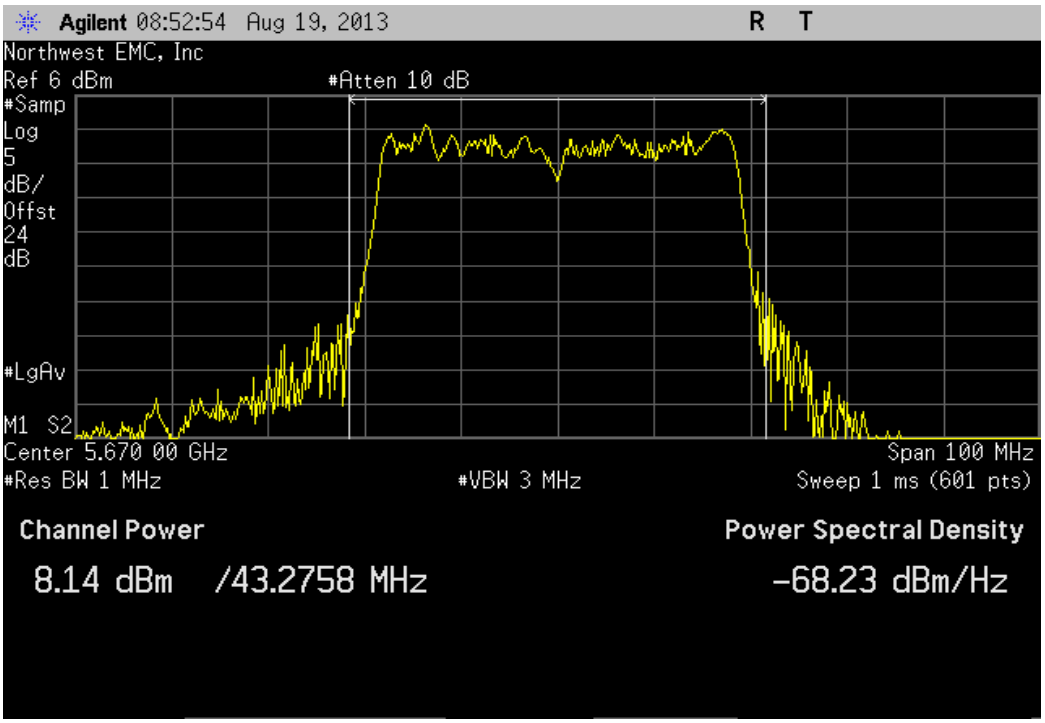
40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz						
				Value	Limit	Result
				10.186 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

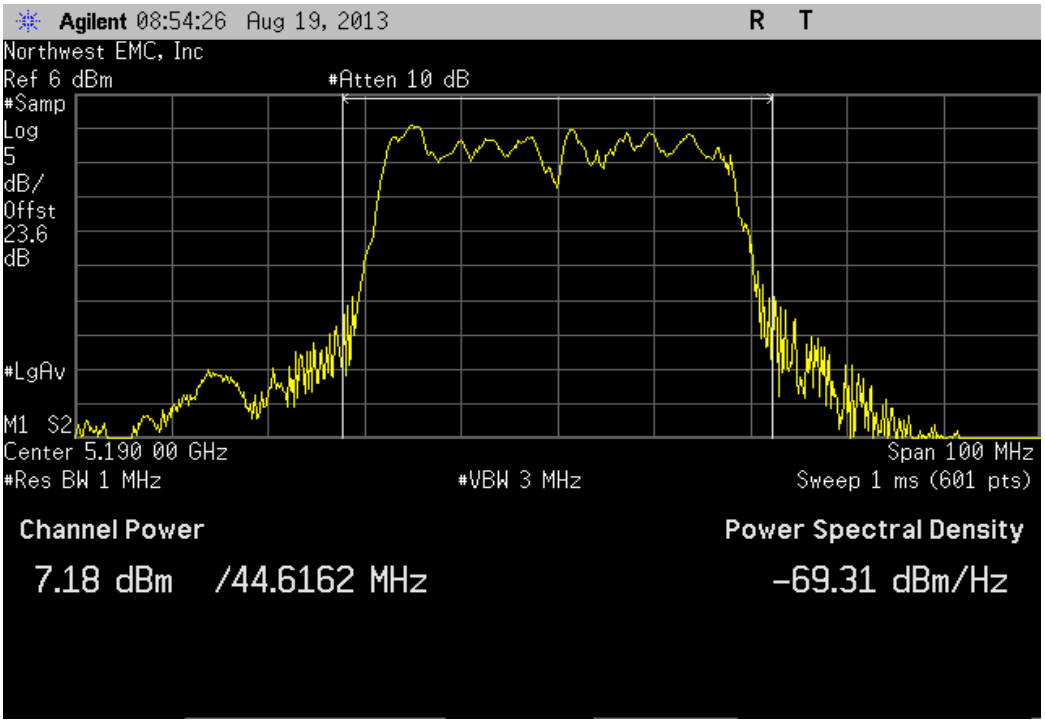
40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				8.136 dBm	< 24 dBm	Pass



40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

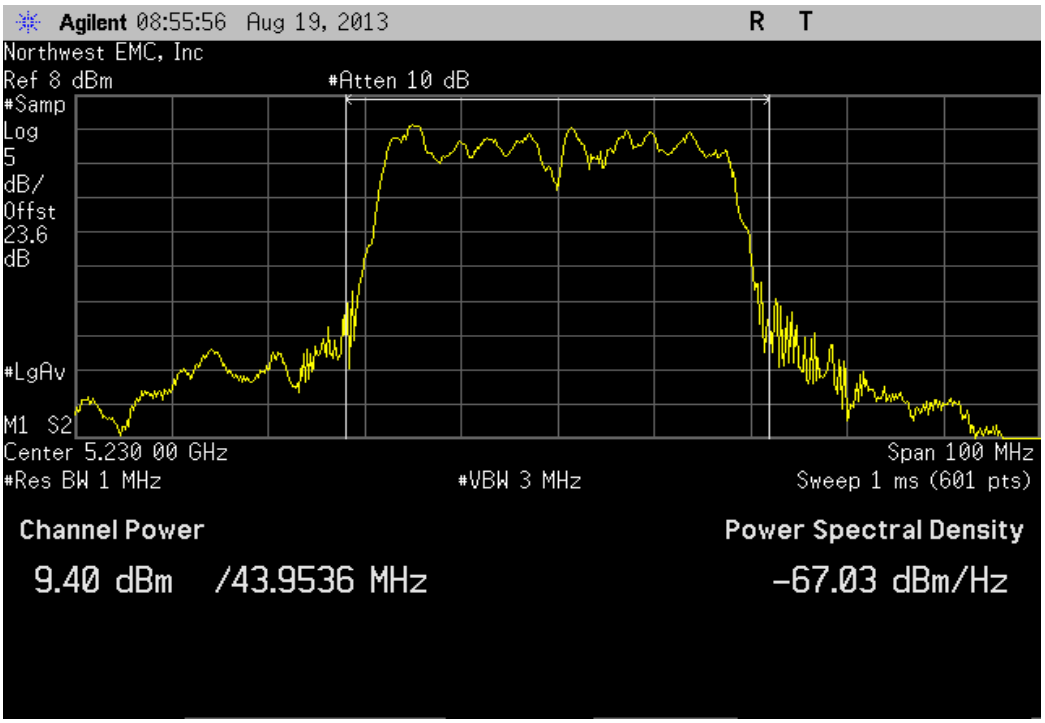
				Value	Limit	Result
				7.184 dBm	< 17 dBm	Pass



Peak Transmit Power - Antenna B

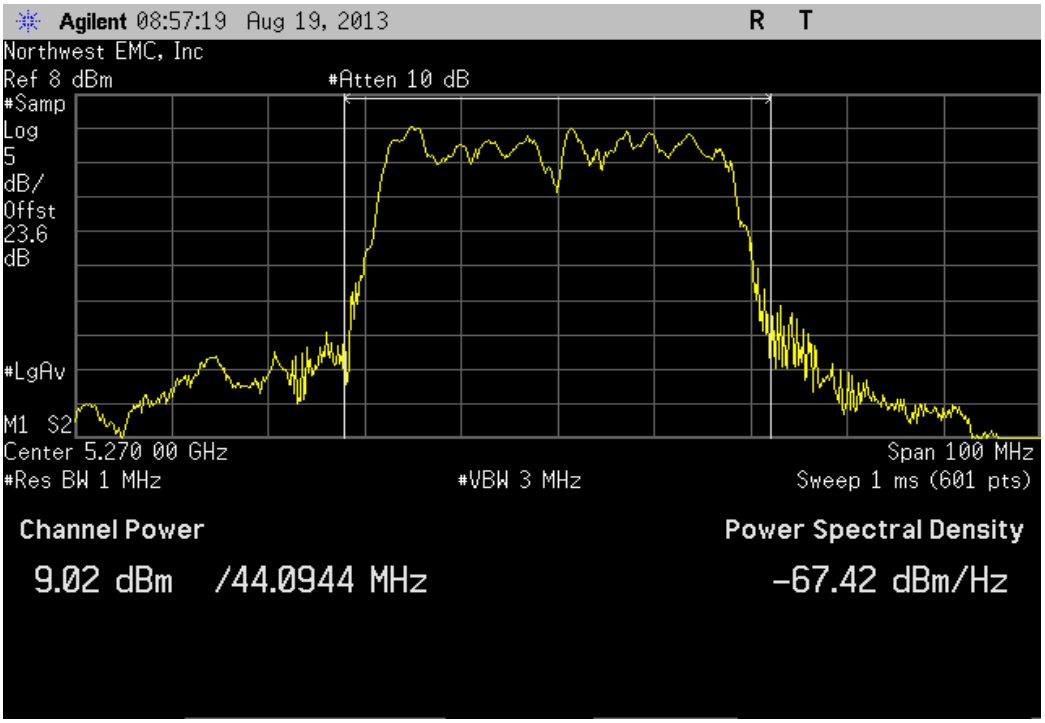
40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				9.395 dBm	< 17 dBm	Pass



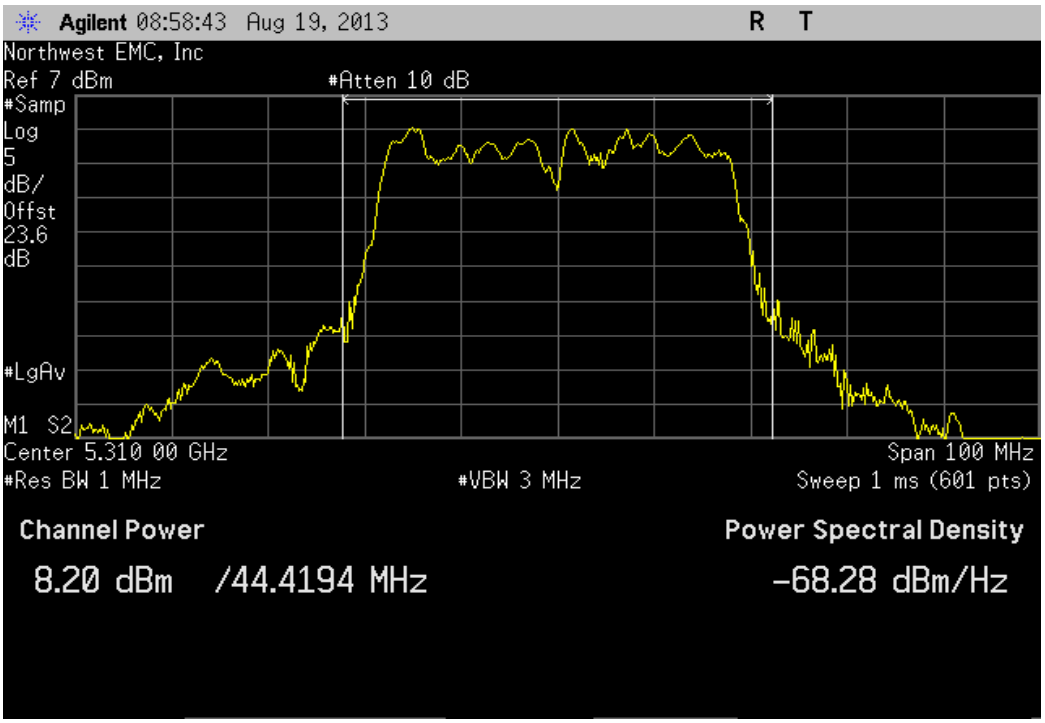
40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				9.024 dBm	< 24 dBm	Pass

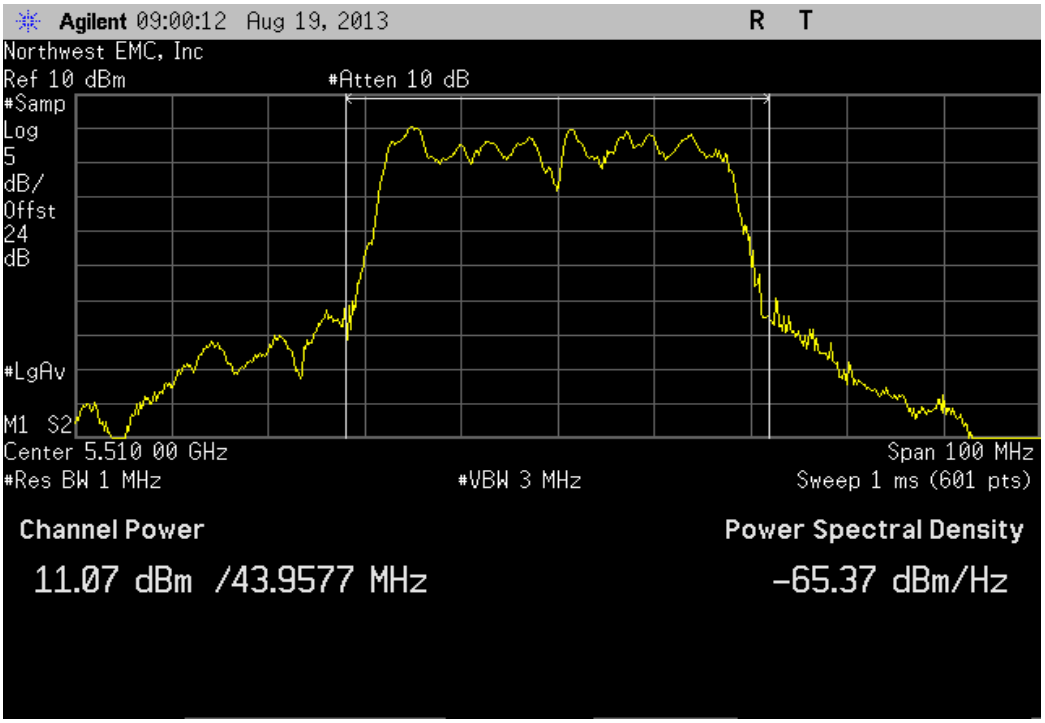


Peak Transmit Power - Antenna B

40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	Result
				8.198 dBm	< 24 dBm	Pass

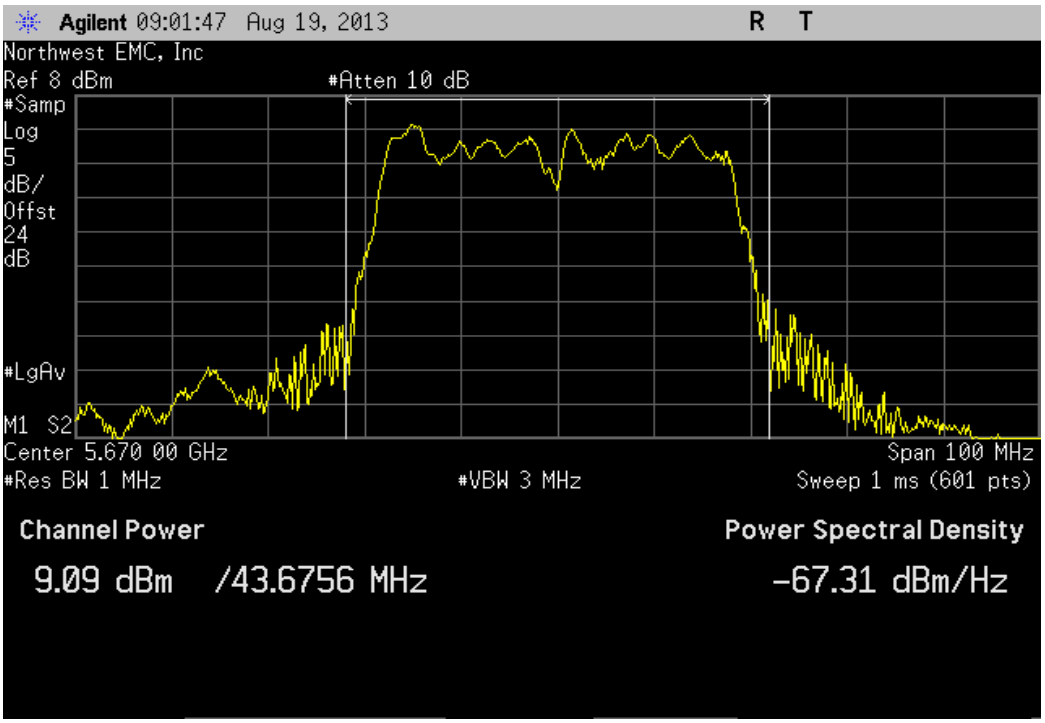


40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz						
				Value	Limit	Result
				11.065 dBm	< 24 dBm	Pass



Peak Transmit Power - Antenna B

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz						
				Value	Limit	Result
				9.088 dBm	< 24 dBm	Pass



Emission Bandwidth - Antenna A-B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW= > RBW
- A peak detector was used
- Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Emission Bandwidth - Antenna A-B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% duty cycle. Adapter cable loss of 1.3 dB added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

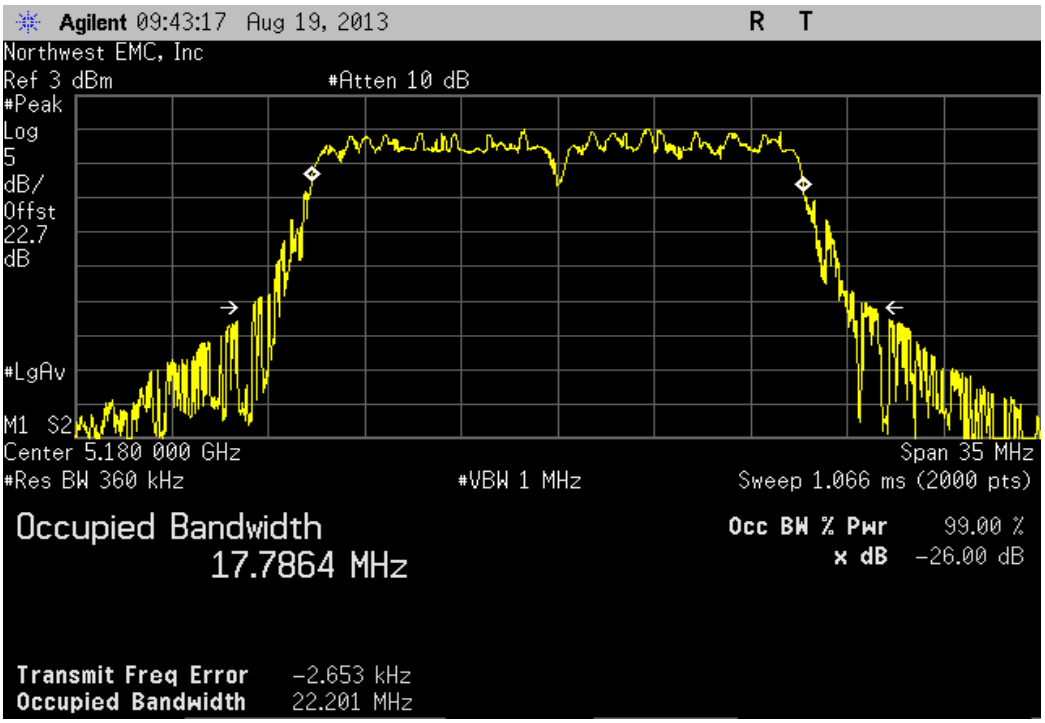
Configuration #	1	Signature

			Value	Limit	Result
Chain A					
	20 MHz				
		802.11(n) MCS8			
		Ch 36, Low Channel 5180 MHz	22.201 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	21.966 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	22.289 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	22.222 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	22.114 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	21.924 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	22.265 MHz	> 500 kHz	Pass
		802.11(n) MCS15			
		Ch 36, Low Channel 5180 MHz	22.302 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	22.02 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	22.394 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	22.032 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	22.153 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	21.688 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	22.121 MHz	> 500 kHz	Pass
	40 MHz				
		802.11(n) MCS8			
		Ch 36/40, Low Channel 5190 MHz	41.781 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	41.979 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	41.669 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	41.804 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	41.893 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	42.076 MHz	> 500 kHz	Pass
		802.11(n) MCS15			
		Ch 36/40, Low Channel 5190 MHz	41.742 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	41.905 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	41.984 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	41.637 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	42.335 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	42.059 MHz	> 500 kHz	Pass
Chain B					
	20 MHz				
		802.11(n) MCS8			
		Ch 36, Low Channel 5180 MHz	21.564 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	21.385 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	21.906 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	21.254 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	21.145 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	21.682 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	21.199 MHz	> 500 kHz	Pass
		802.11(n) MCS15			
		Ch 36, Low Channel 5180 MHz	21.692 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	21.885 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	21.418 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	21.494 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	21.419 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	21.723 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	21.424 MHz	> 500 kHz	Pass
	40 MHz				
		802.11(n) MCS8			
		Ch 36/40, Low Channel 5190 MHz	42.409 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	42.731 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	42.388 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	42.574 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	42.93 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	42.723 MHz	> 500 kHz	Pass
		802.11(n) MCS15			
		Ch 36/40, Low Channel 5190 MHz	41.932 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	42.339 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	42.264 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	42.065 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	42.607 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	41.895 MHz	> 500 kHz	Pass

Emission Bandwidth - Antenna A-B

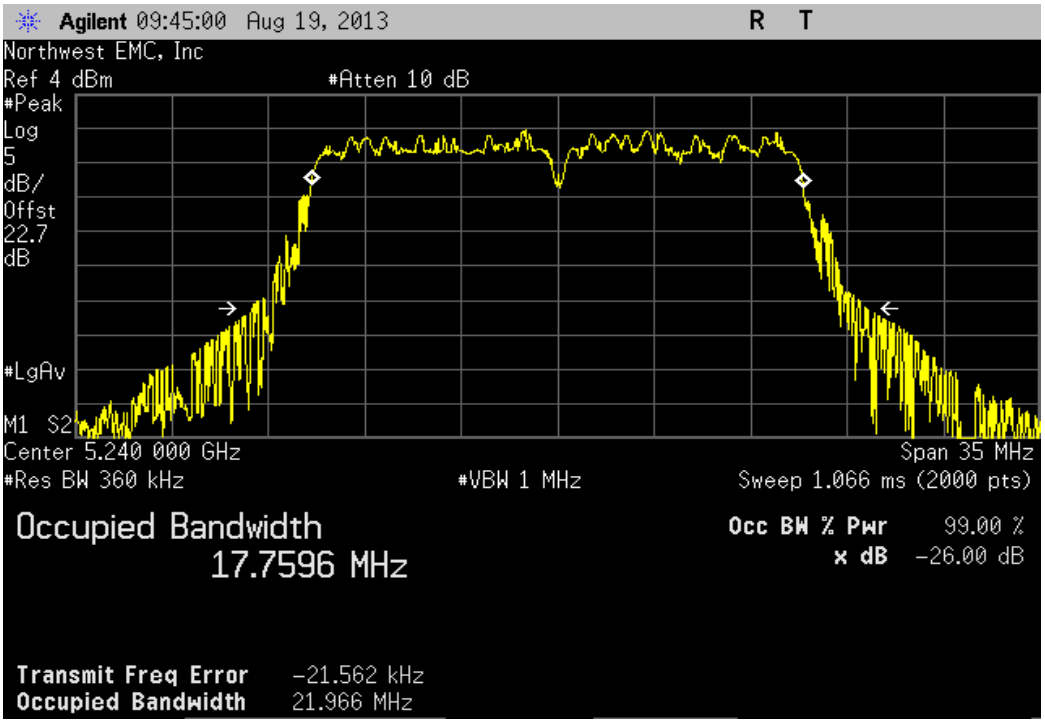
Chain A, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				22.201 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

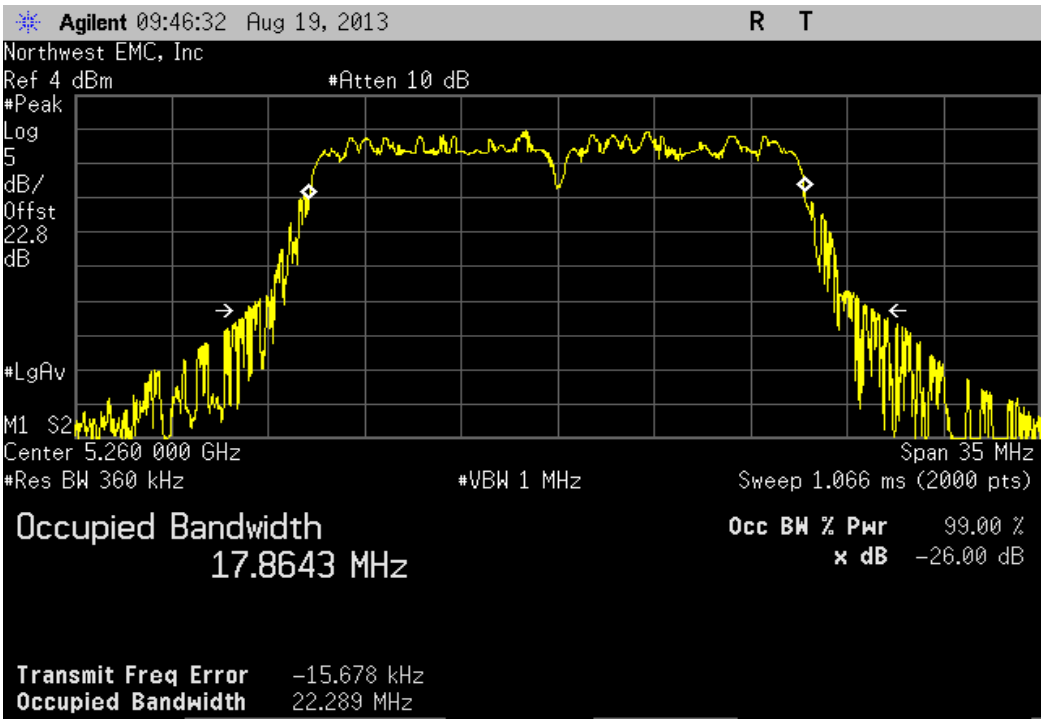
				Value	Limit	Result
				21.966 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

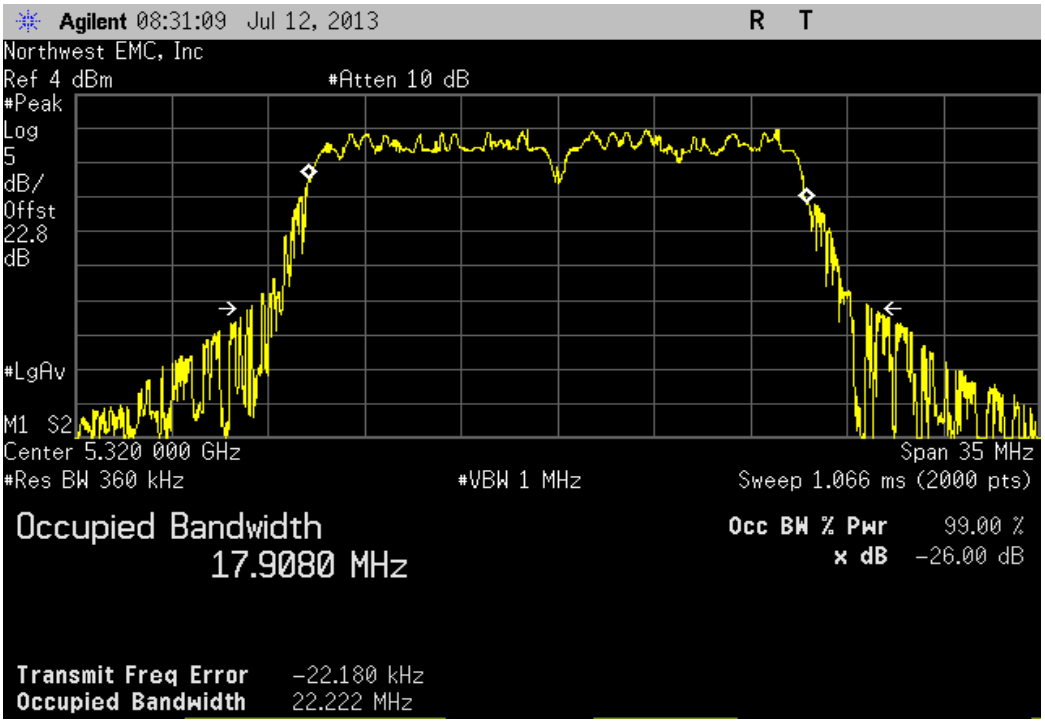
Chain A, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				22.289 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

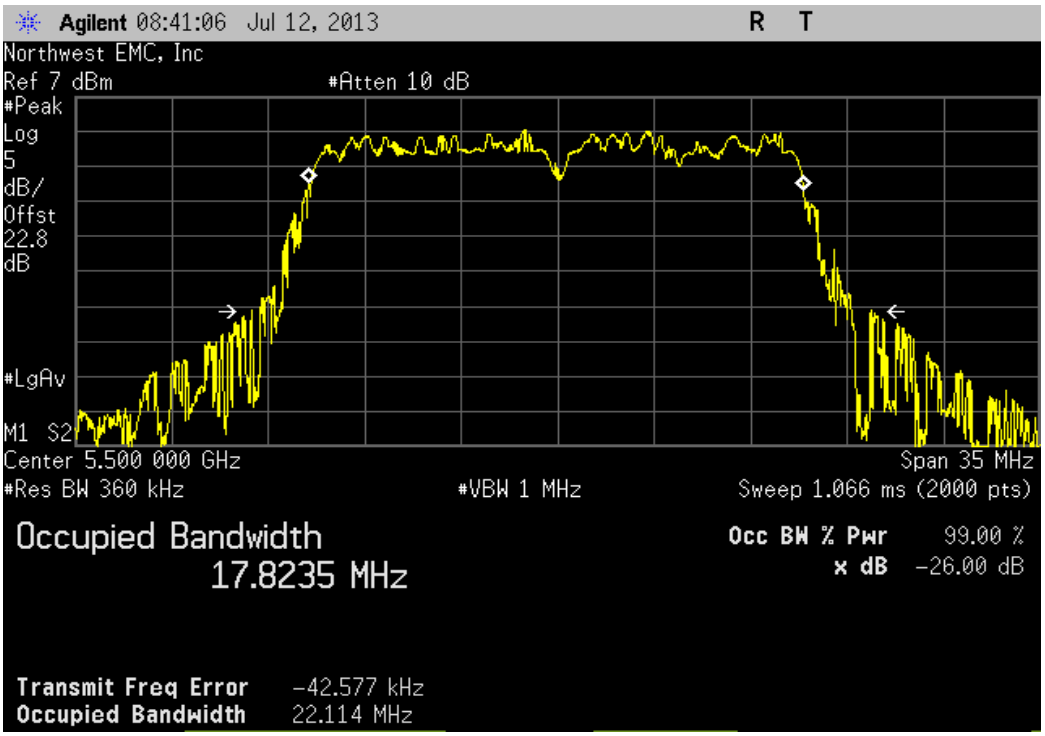
				Value	Limit	Result
				22.222 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

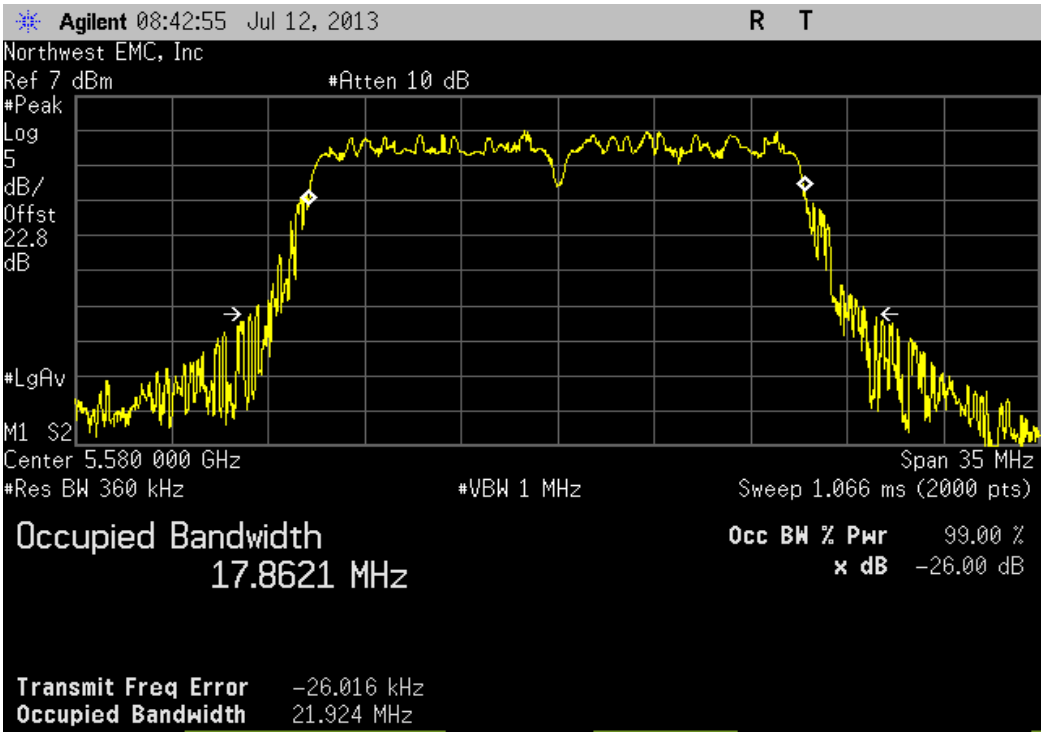
Chain A, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				22.114 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

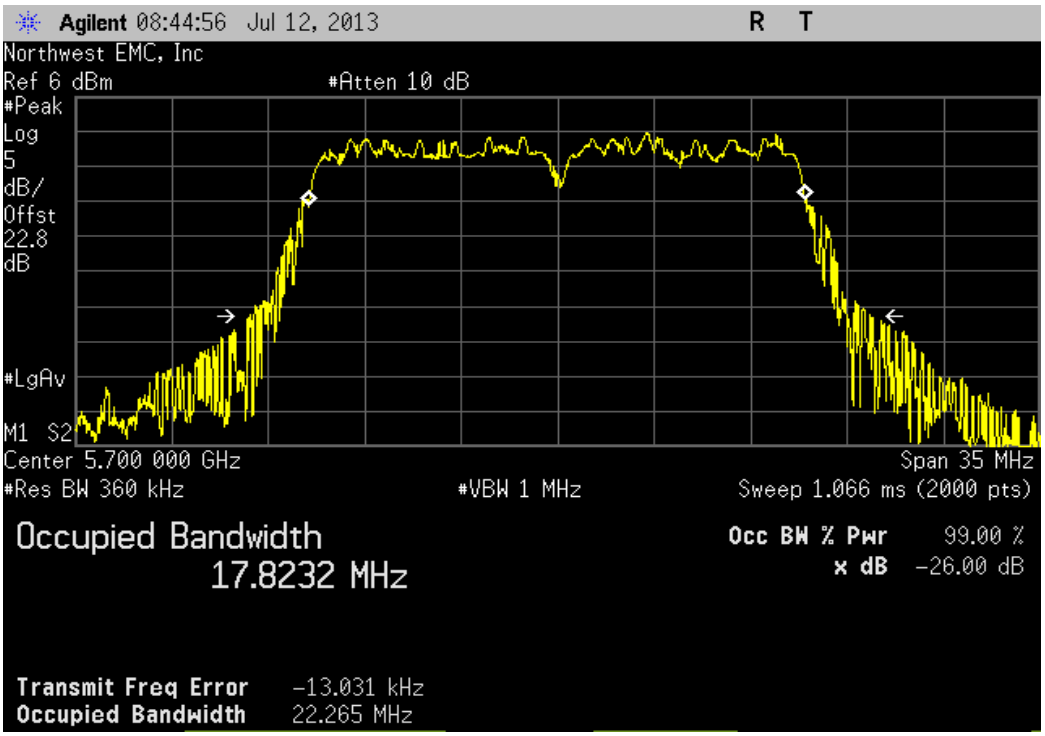
				Value	Limit	Result
				21.924 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

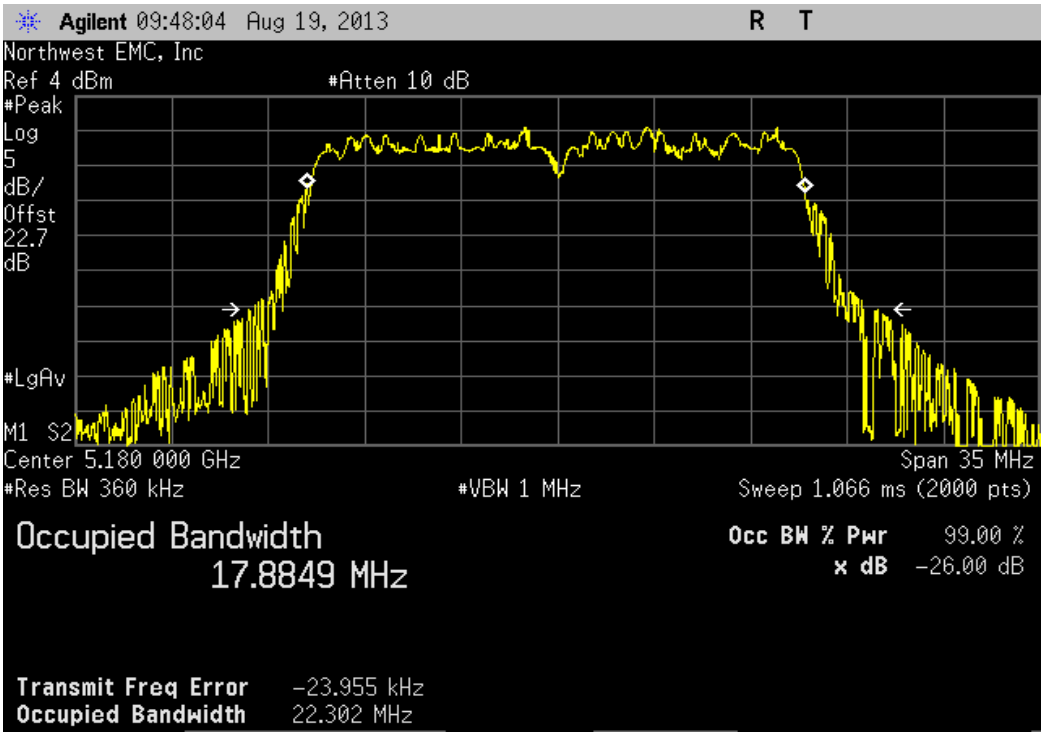
Chain A, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				22.265 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

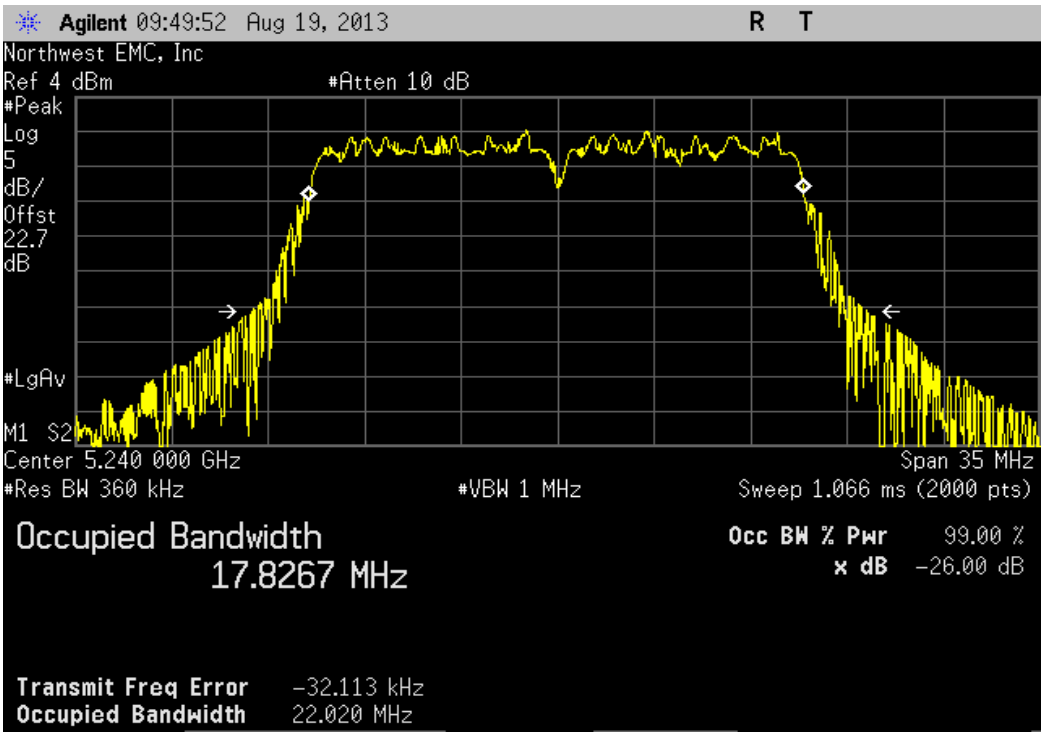
				Value	Limit	Result
				22.302 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

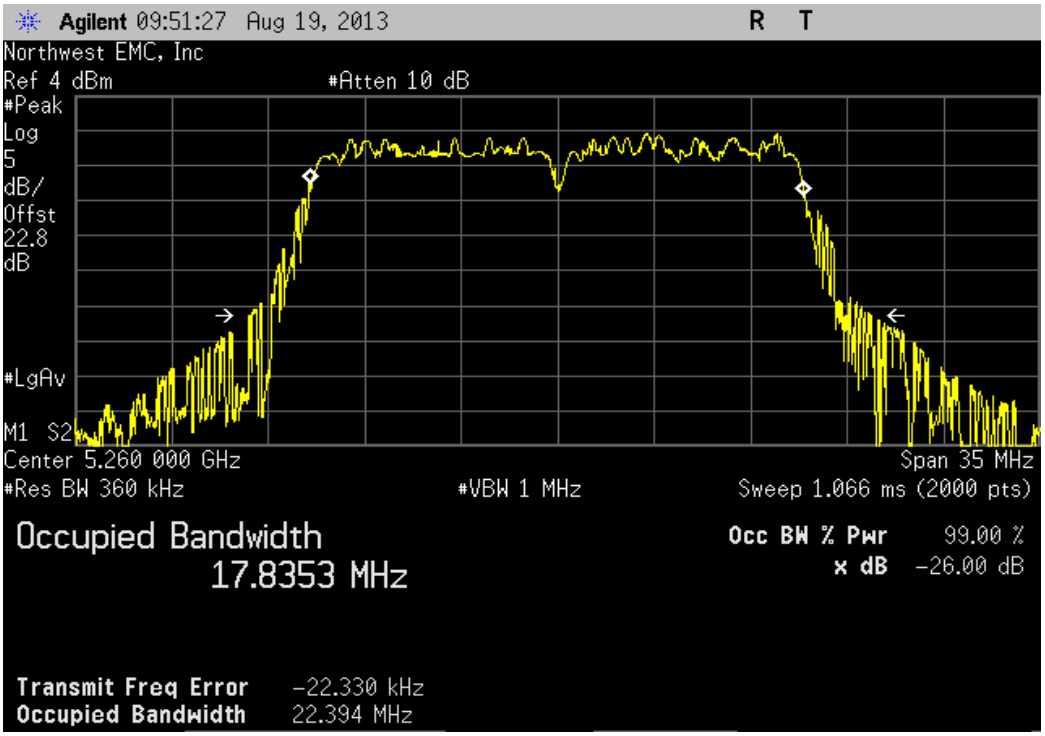
Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				22.02 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

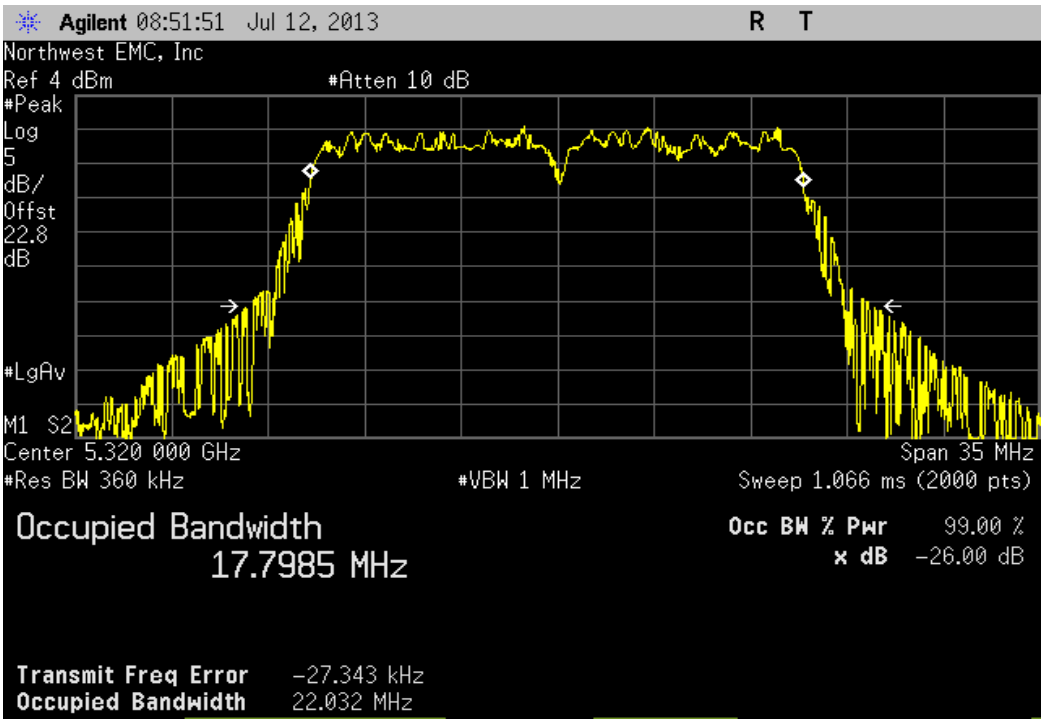
				Value	Limit	Result
				22.394 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

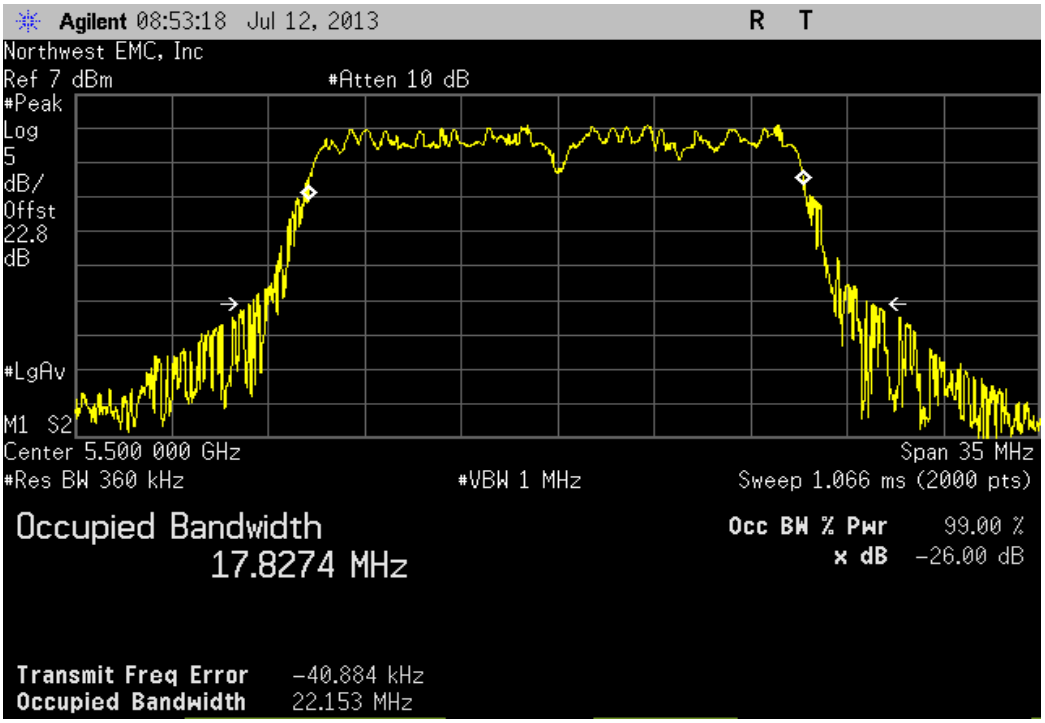
Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				22.032 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz

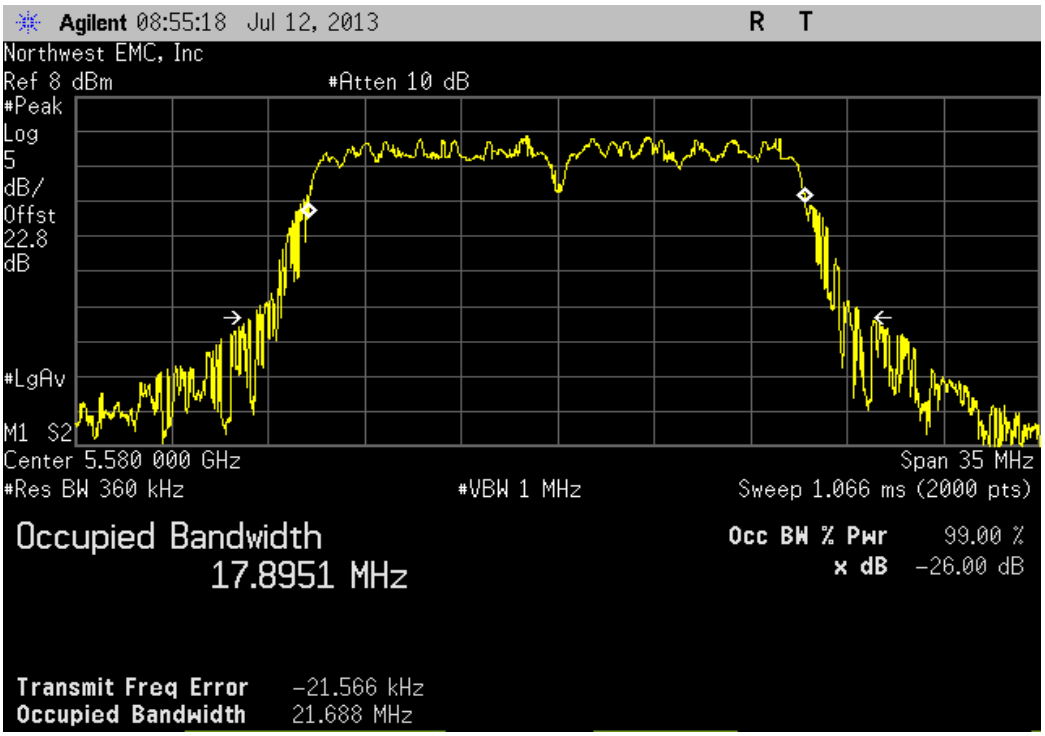
				Value	Limit	Result
				22.153 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

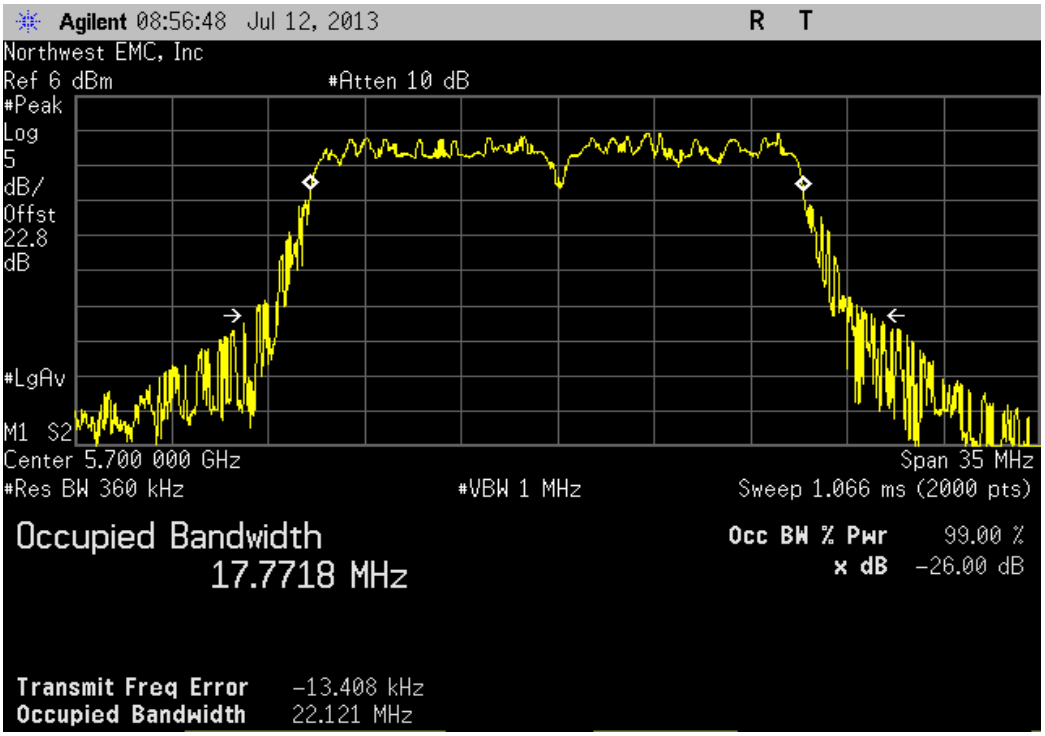
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.688 MHz	> 500 kHz	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

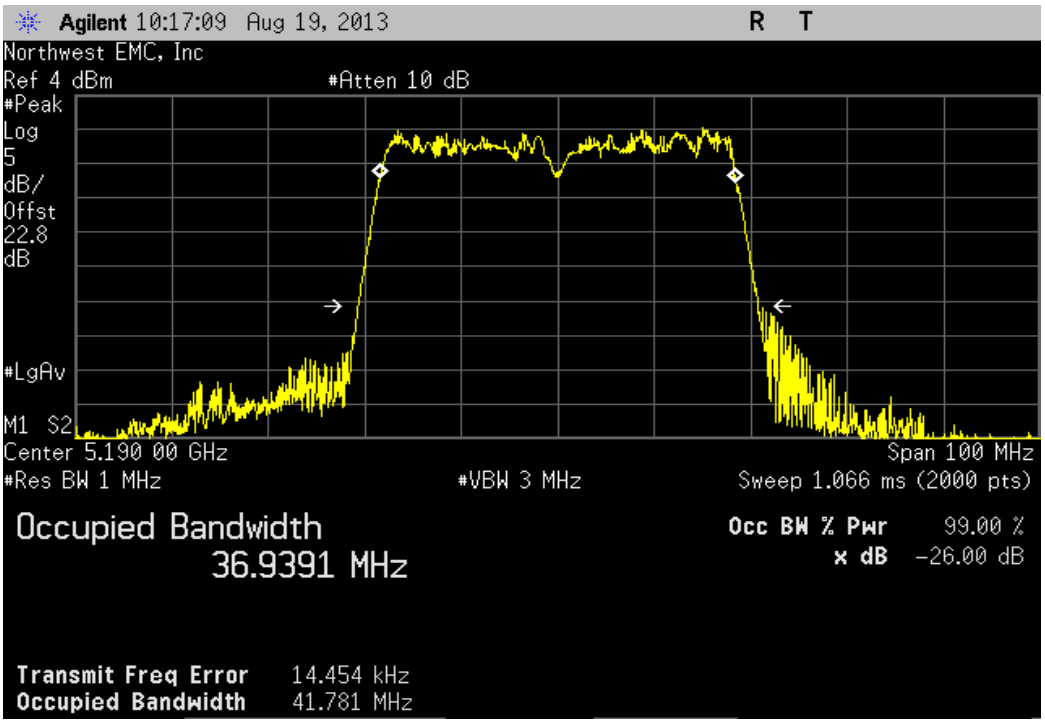
				Value	Limit	Result
				22.121 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

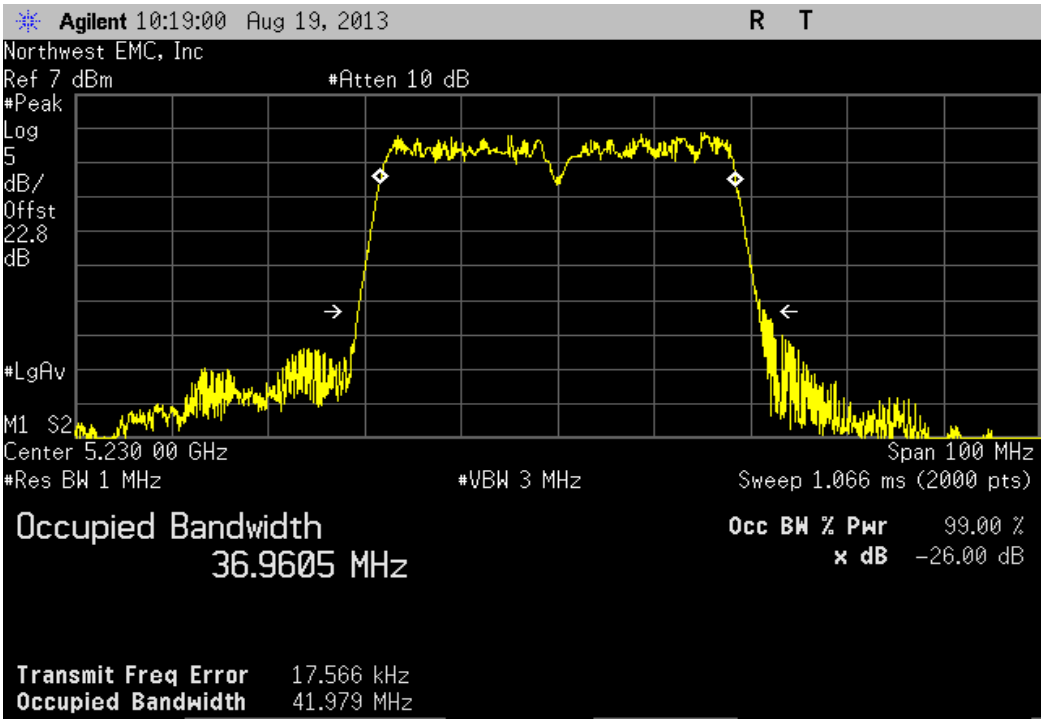
Chain A, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.781 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

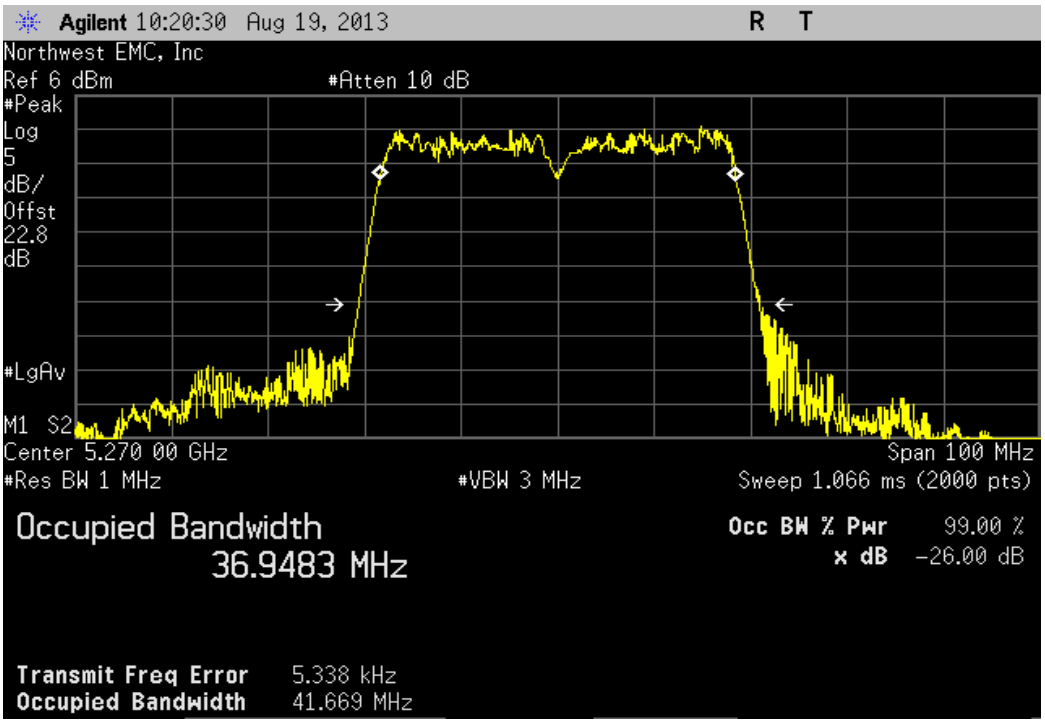
				Value	Limit	Result
				41.979 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

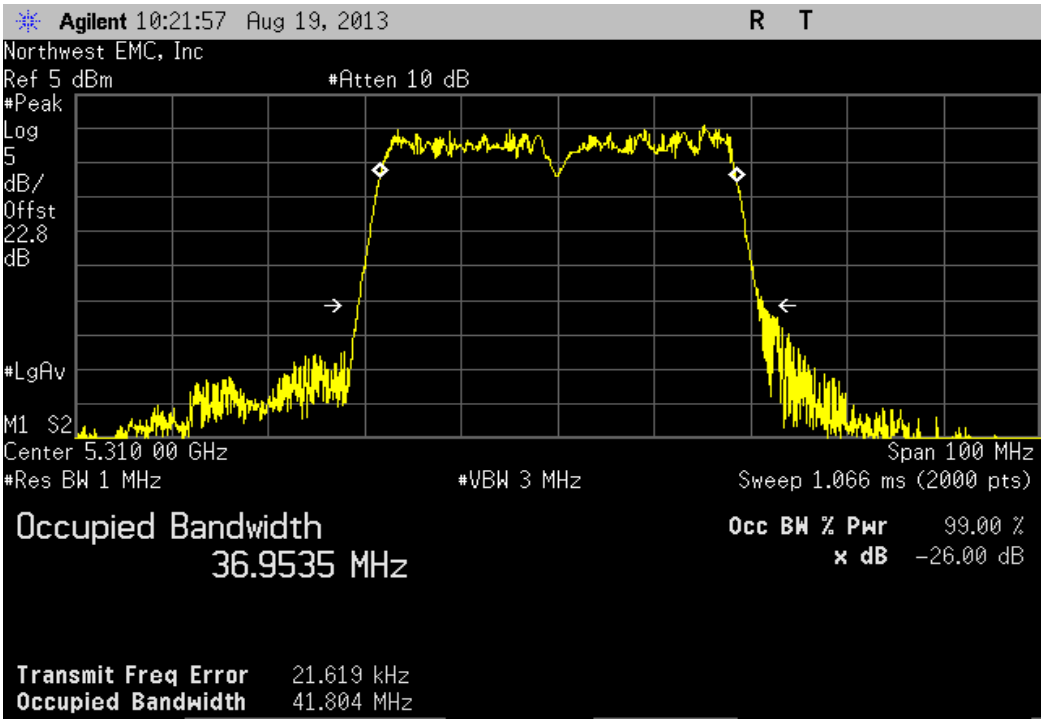
Chain A, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				41.669 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

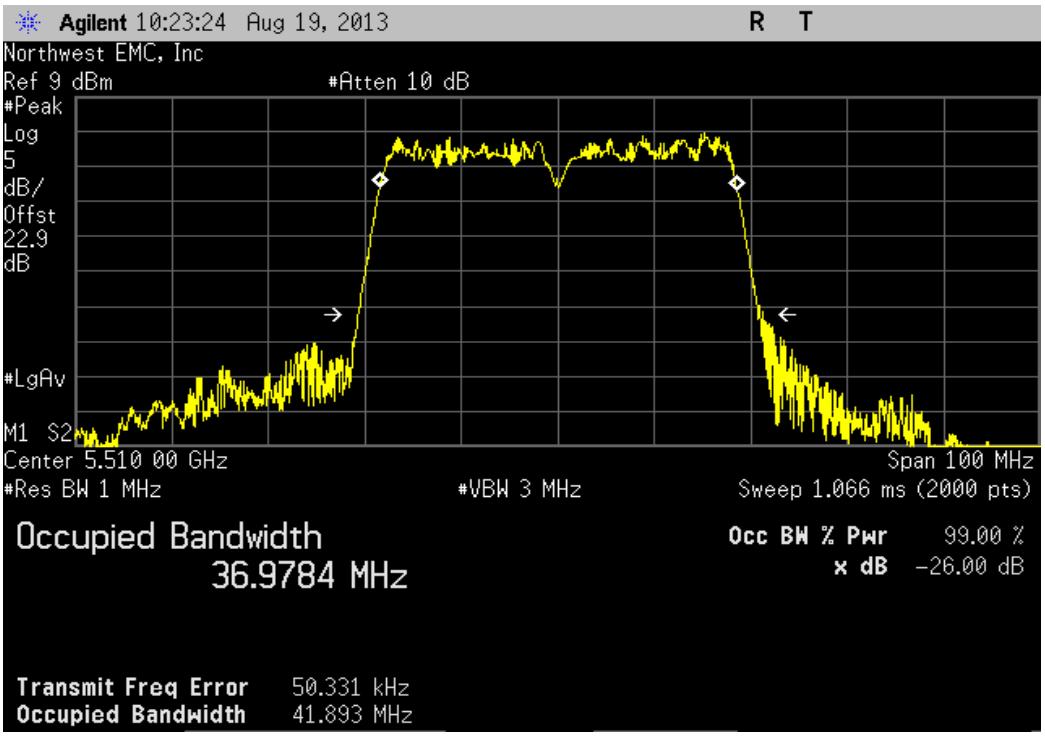
				Value	Limit	Result
				41.804 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

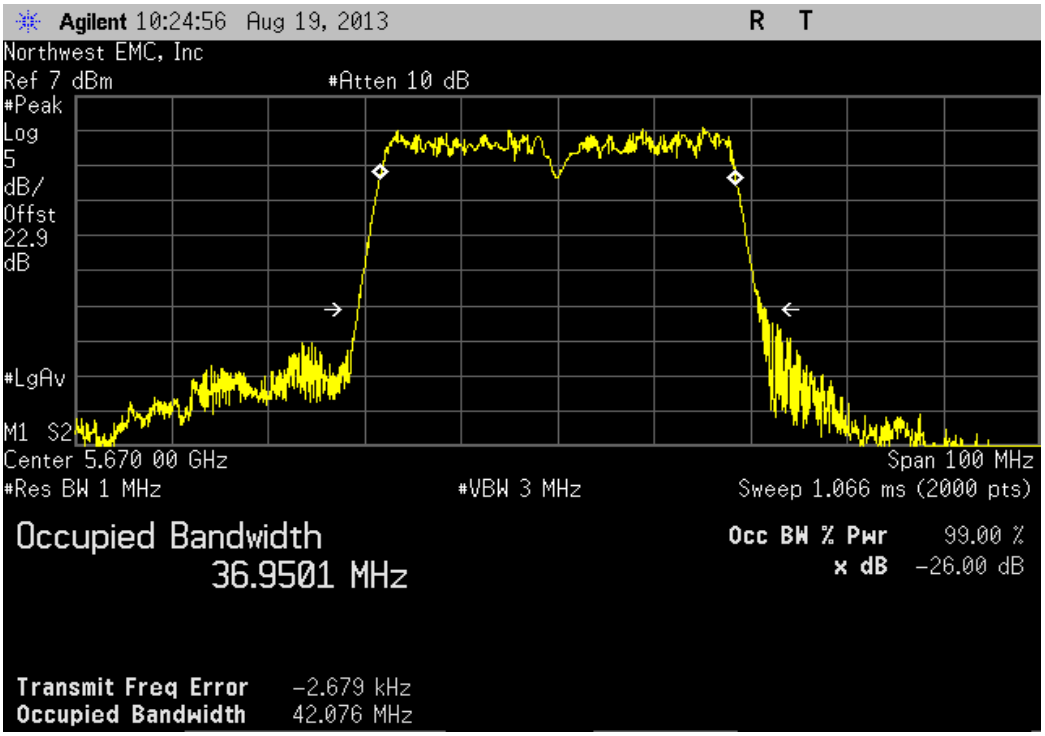
Chain A, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				41.893 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

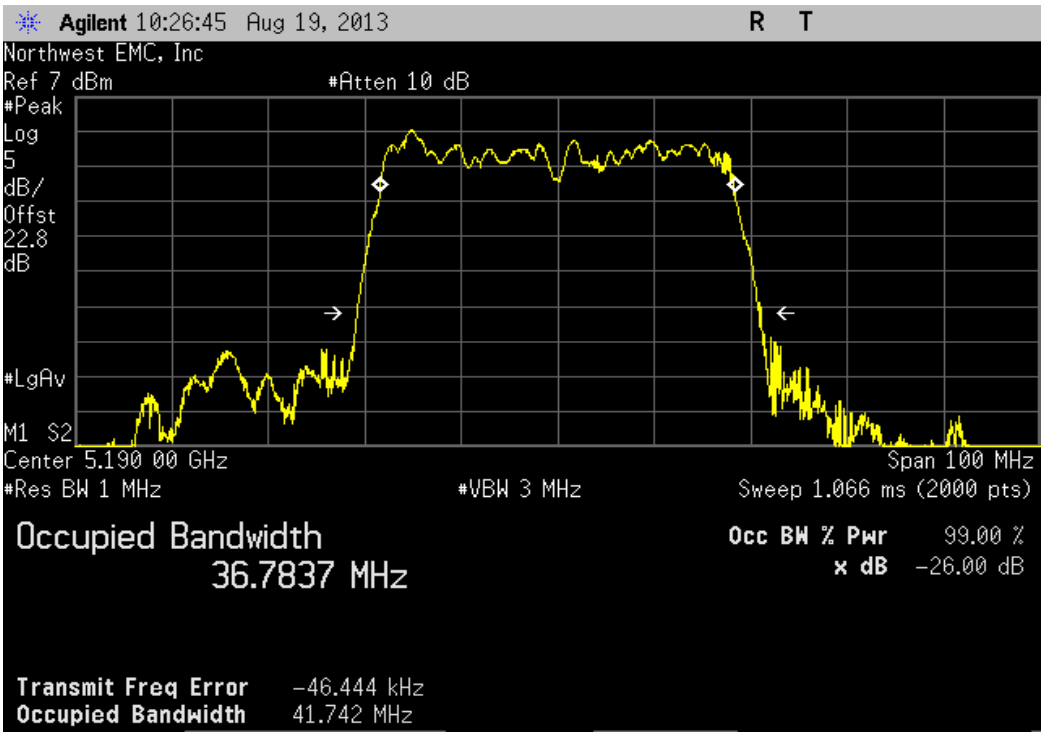
				Value	Limit	Result
				42.076 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

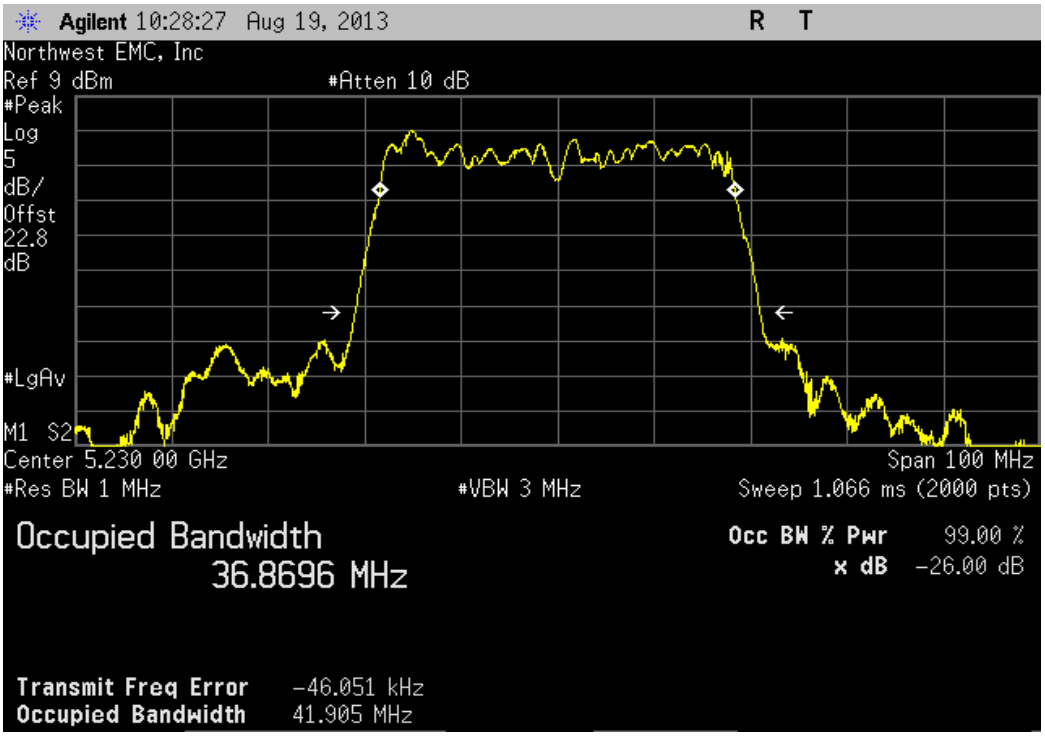
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.742 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

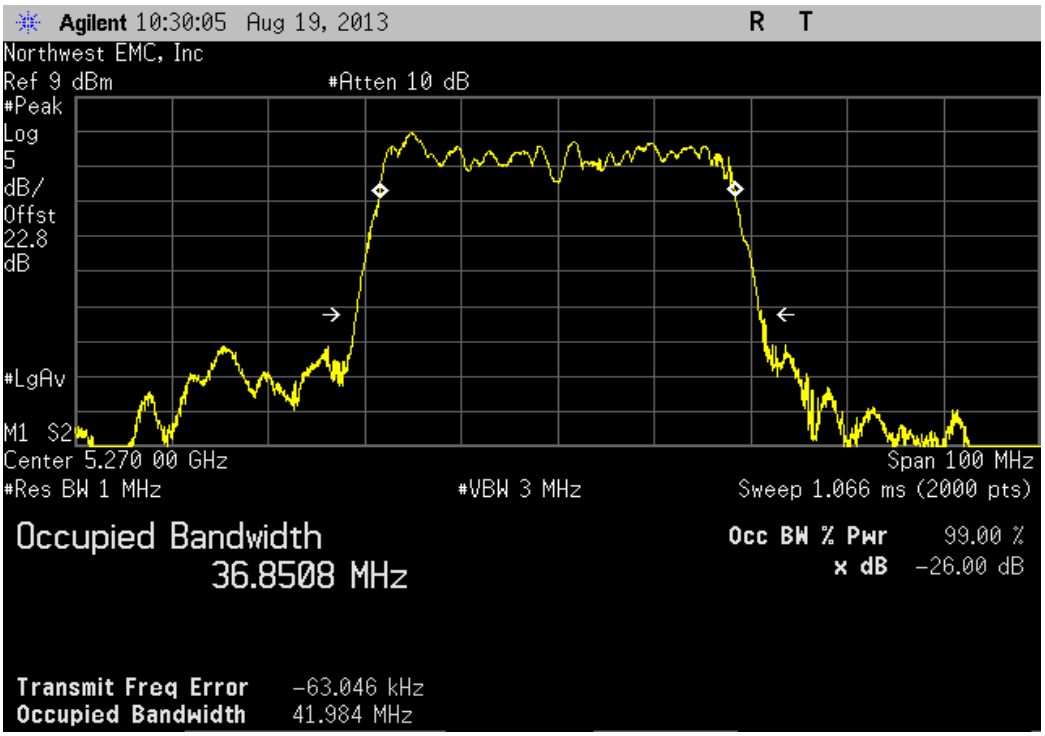
				Value	Limit	Result
				41.905 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

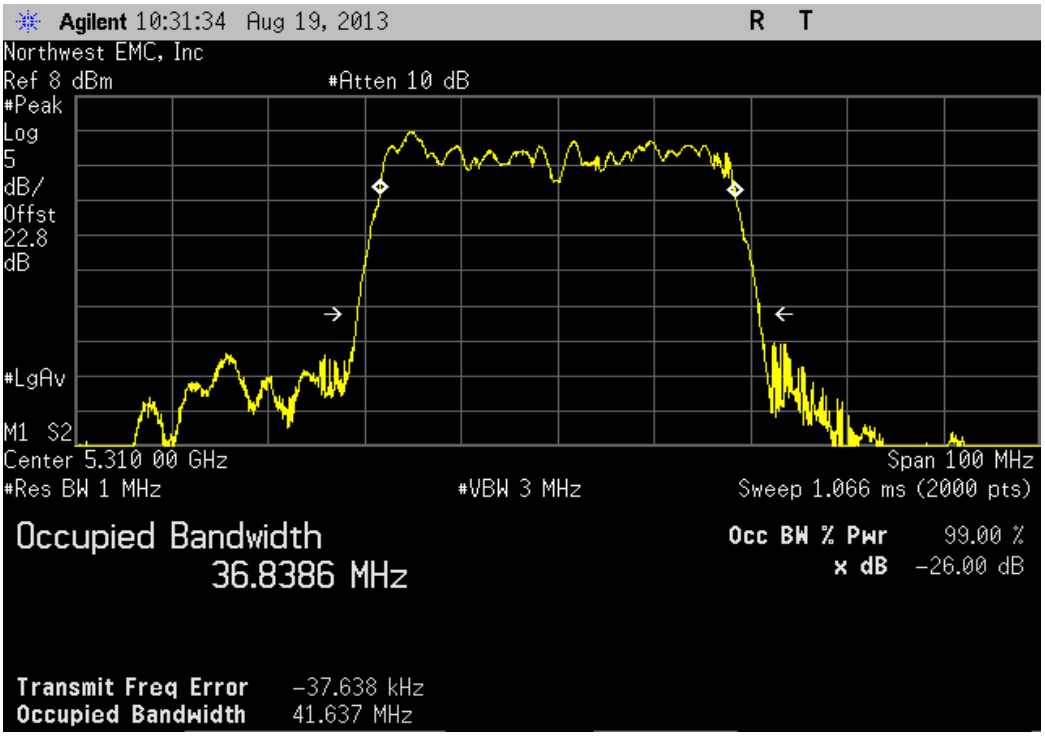
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				41.984 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

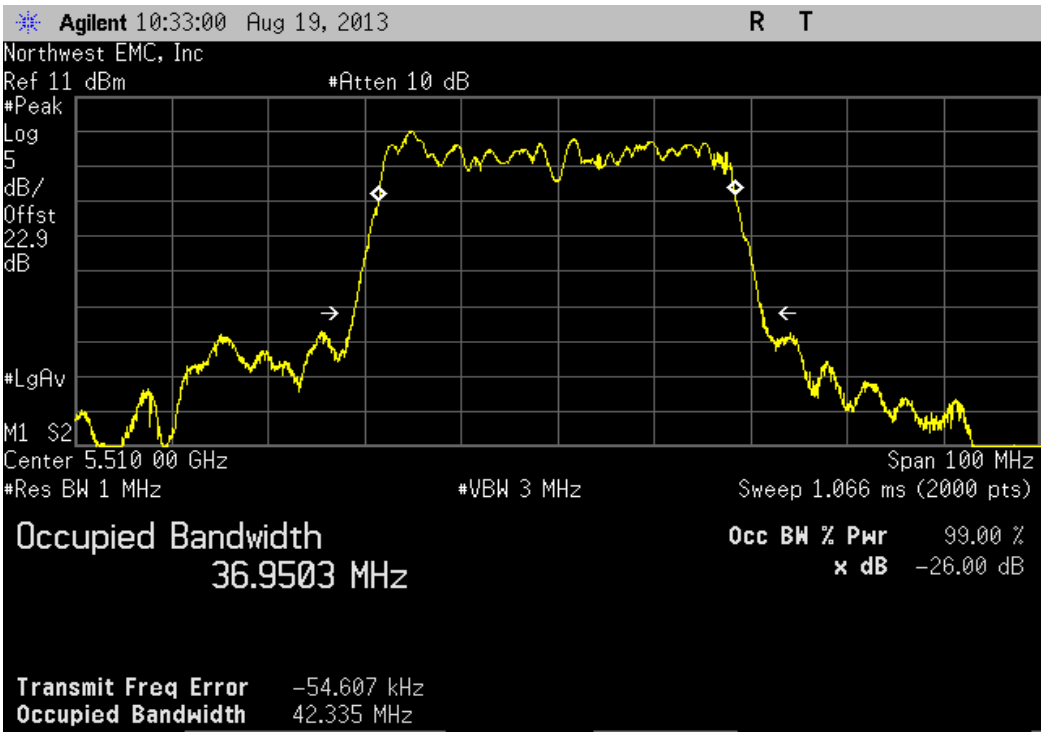
				Value	Limit	Result
				41.637 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

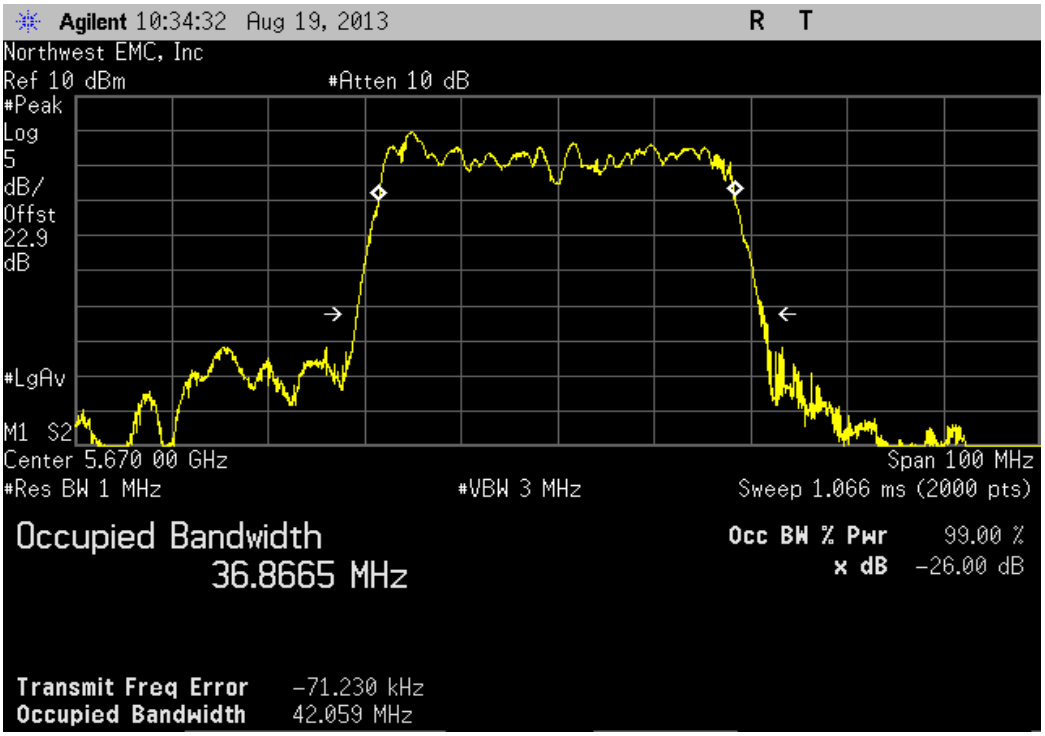
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				42.335 MHz	> 500 kHz	Pass



Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

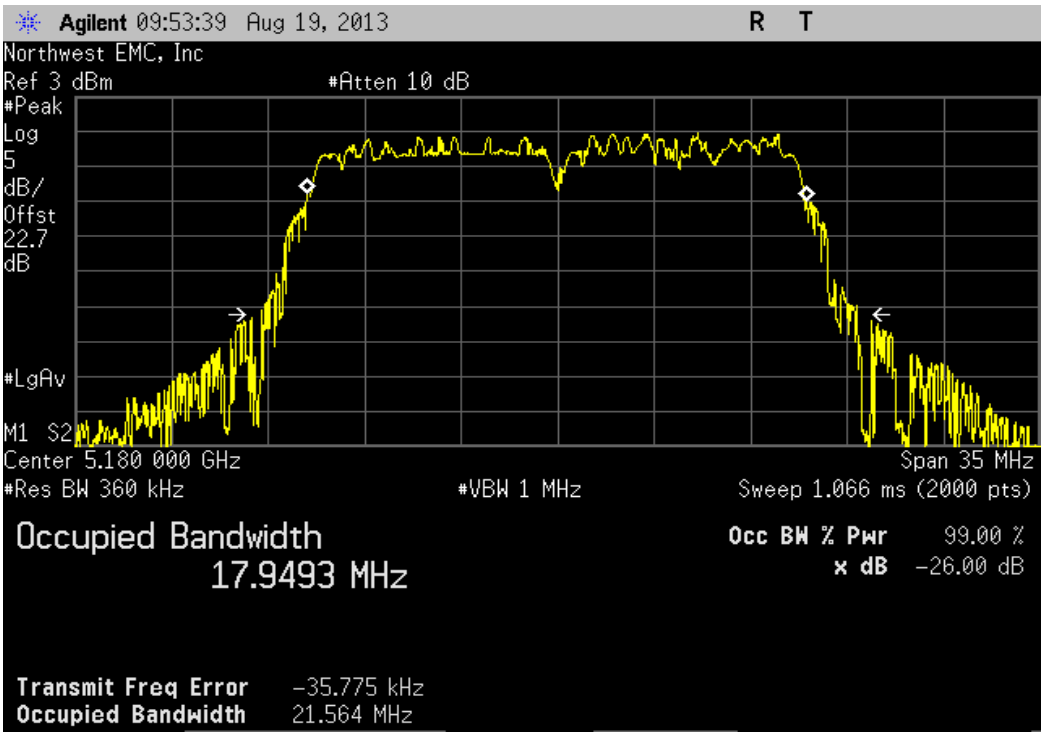
				Value	Limit	Result
				42.059 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

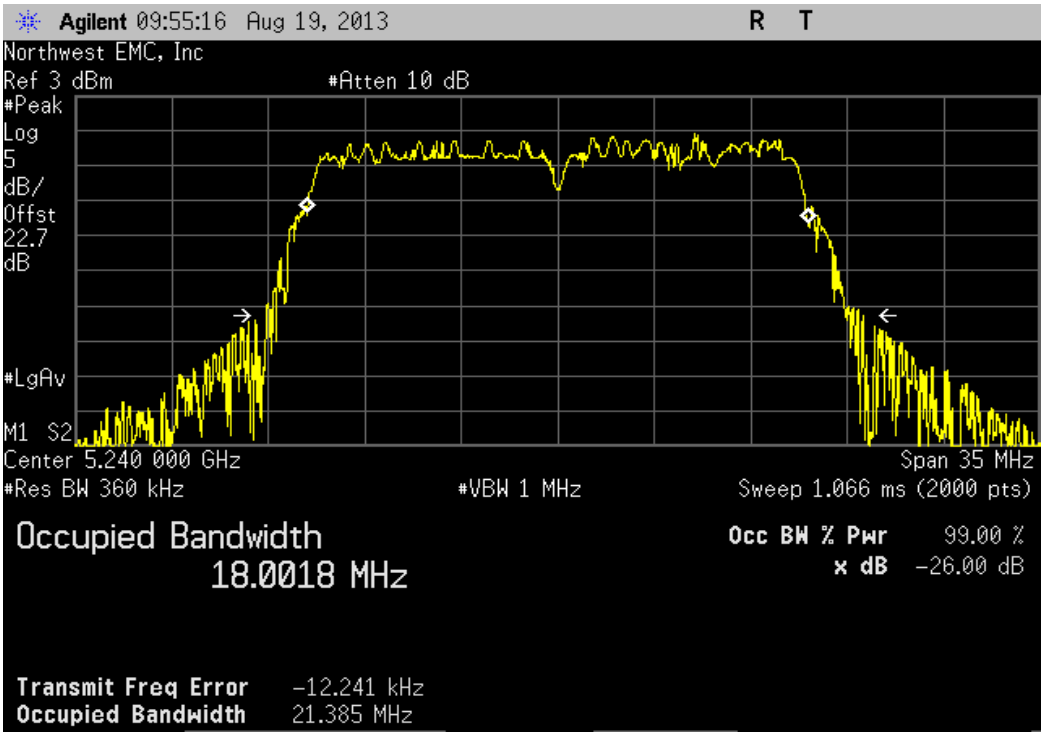
Chain B, 20 MHz, 802.11(n) MCS8, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.564 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 48, High Channel 5240 MHz

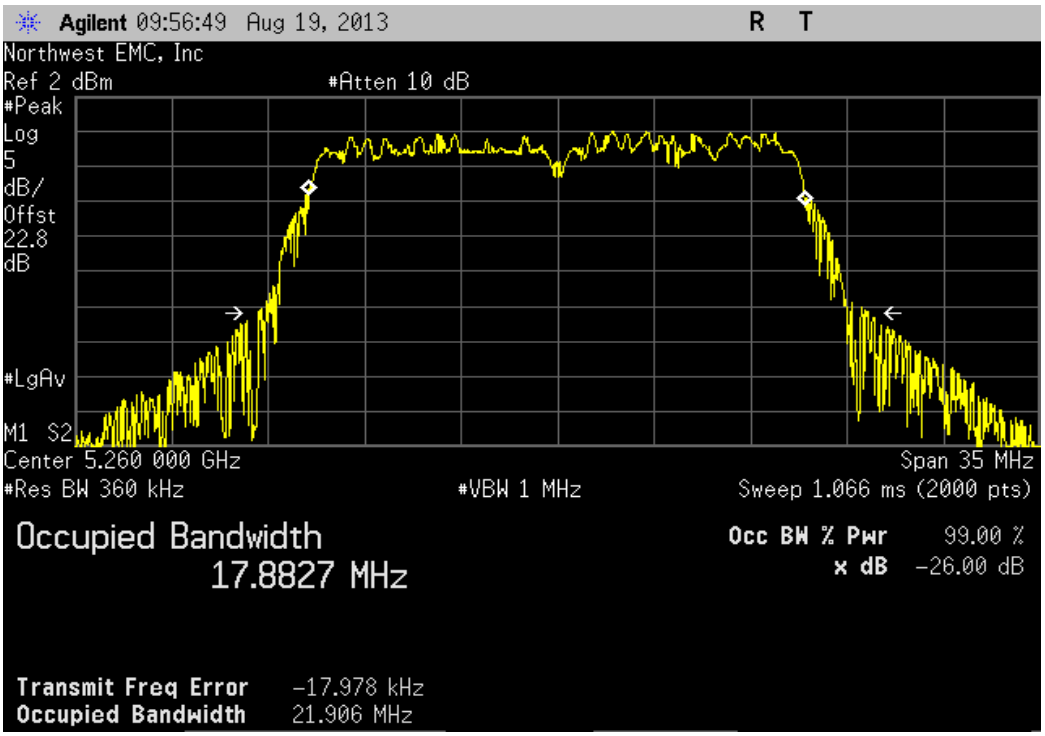
				Value	Limit	Result
				21.385 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

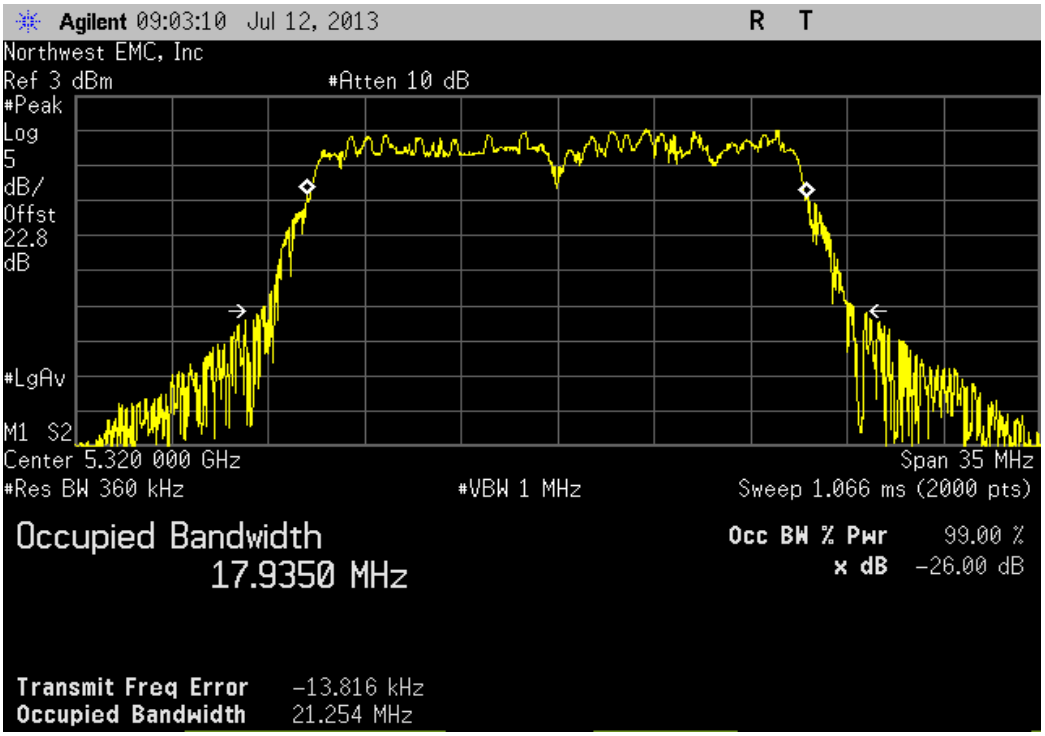
Chain B, 20 MHz, 802.11(n) MCS8, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.906 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 64, High Channel 5320 MHz

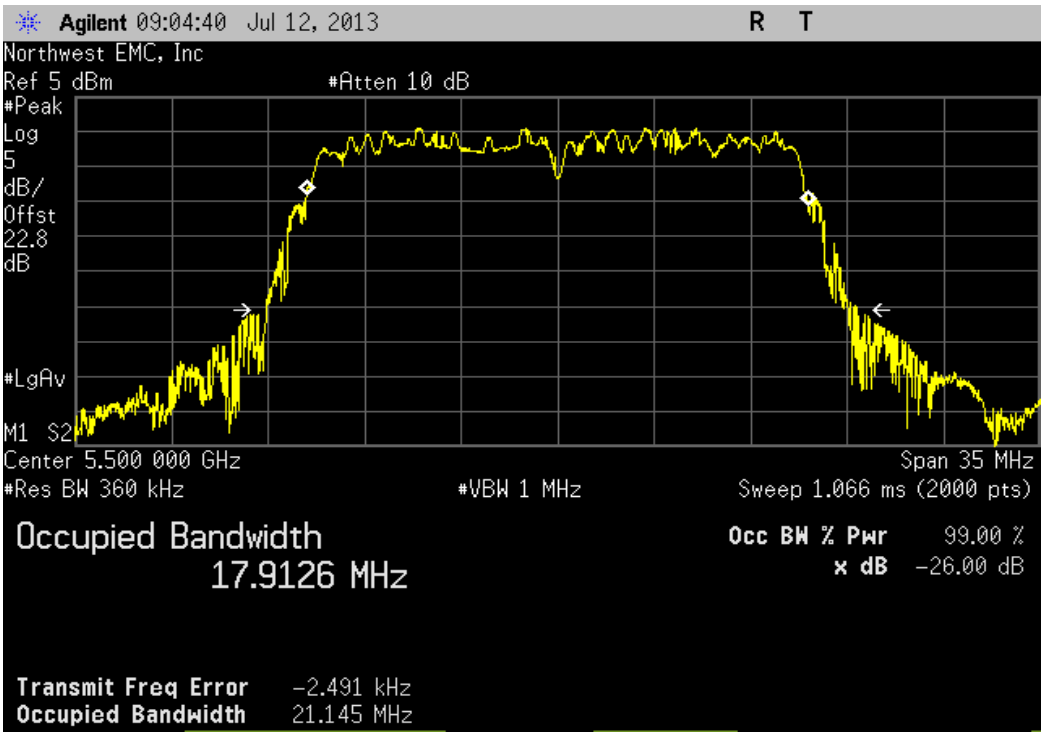
				Value	Limit	Result
				21.254 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

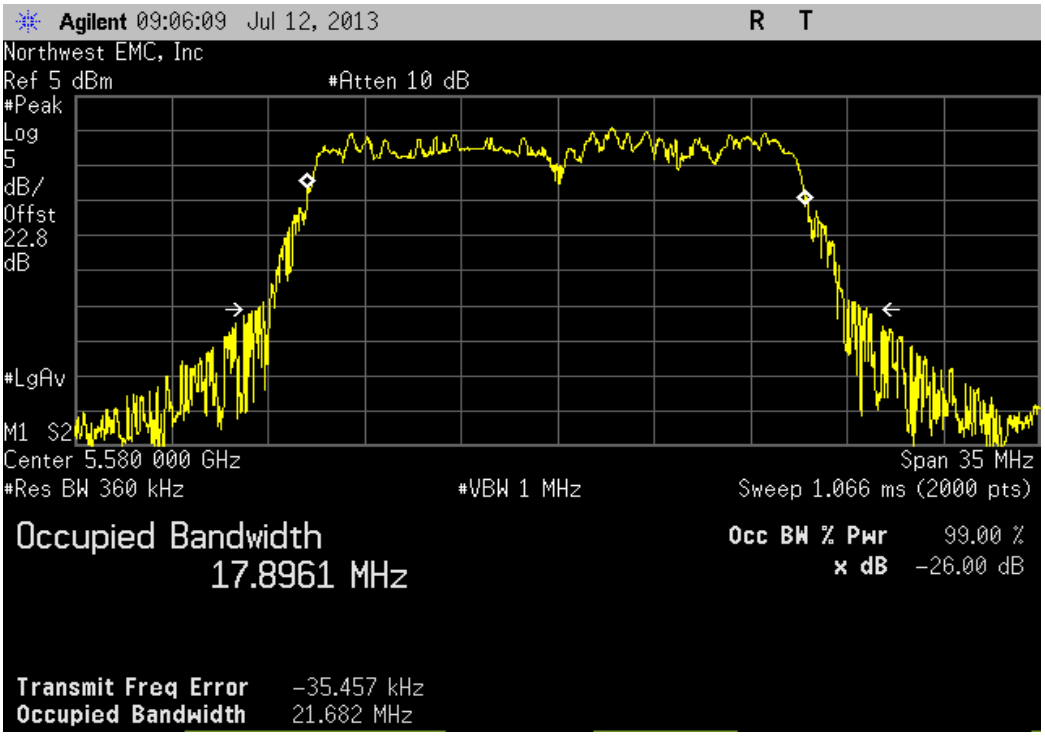
Chain B, 20 MHz, 802.11(n) MCS8, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.145 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, Mid Channel 5580 MHz

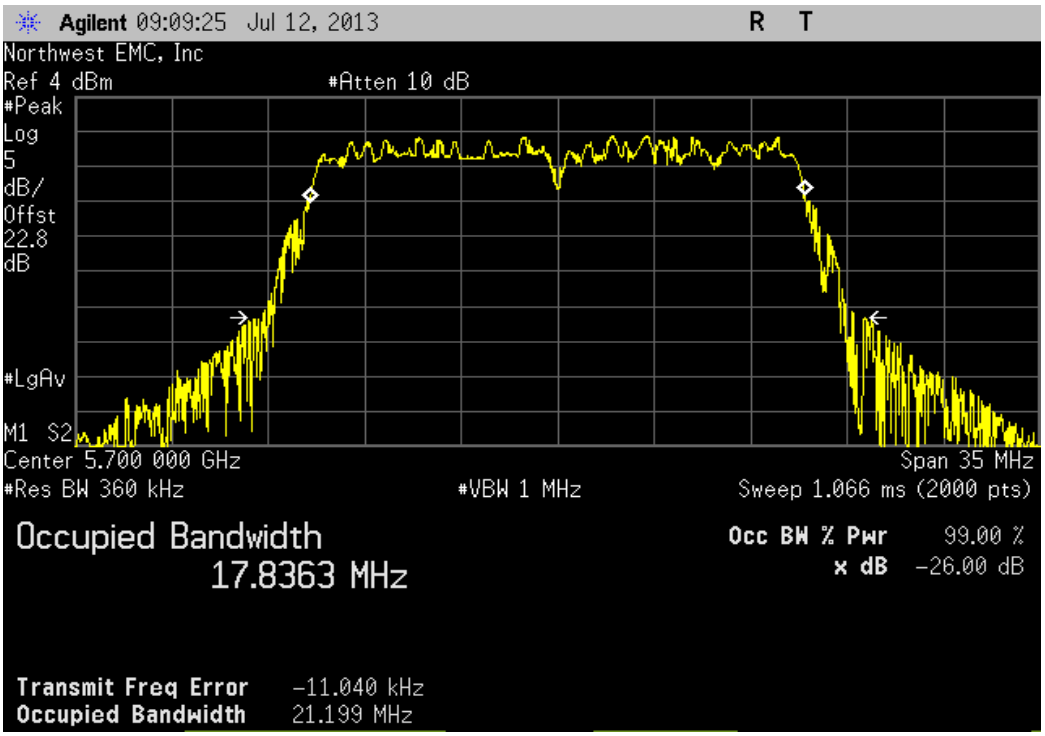
				Value	Limit	Result
				21.682 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

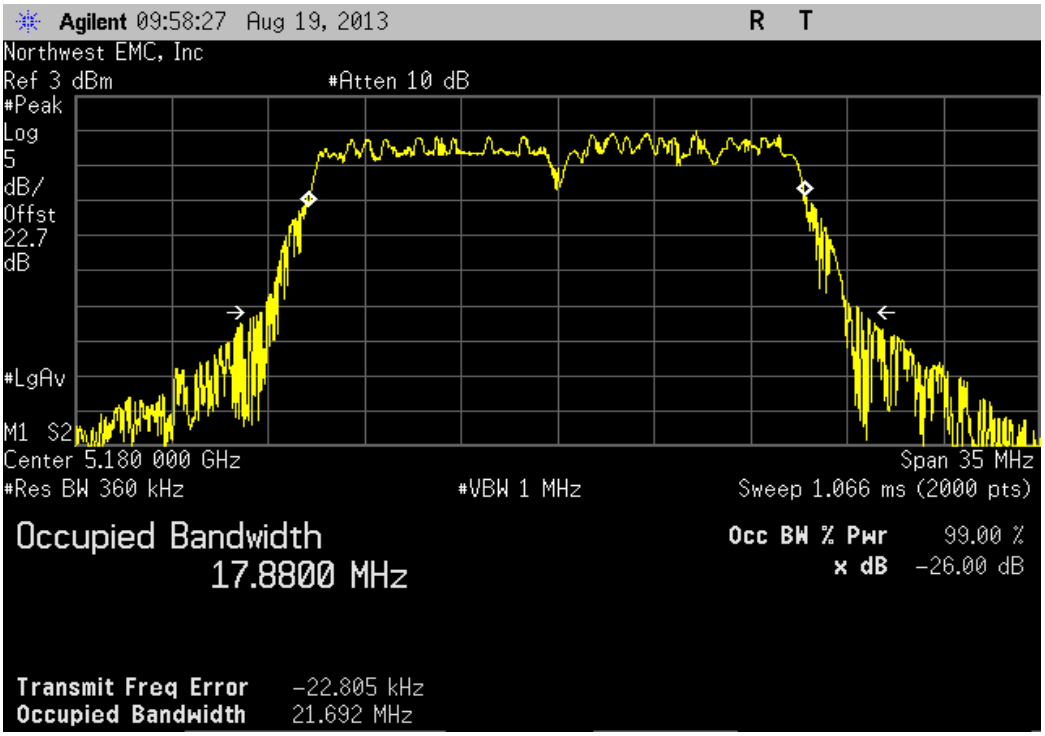
Chain B, 20 MHz, 802.11(n) MCS8, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.199 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

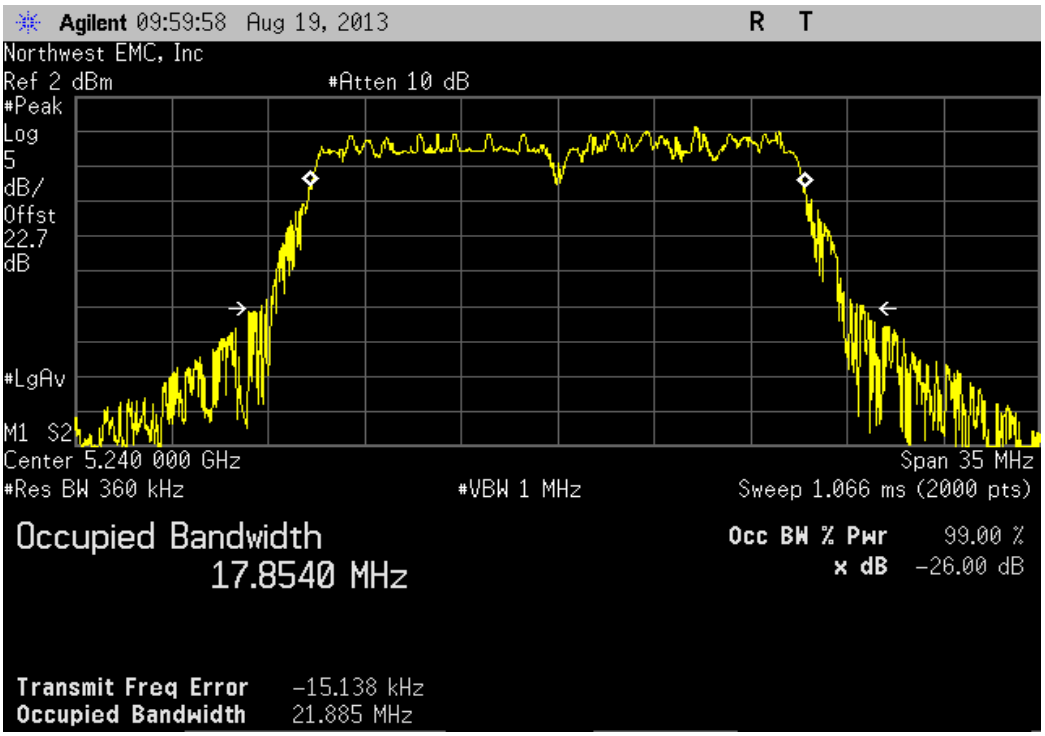
				Value	Limit	Result
				21.692 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

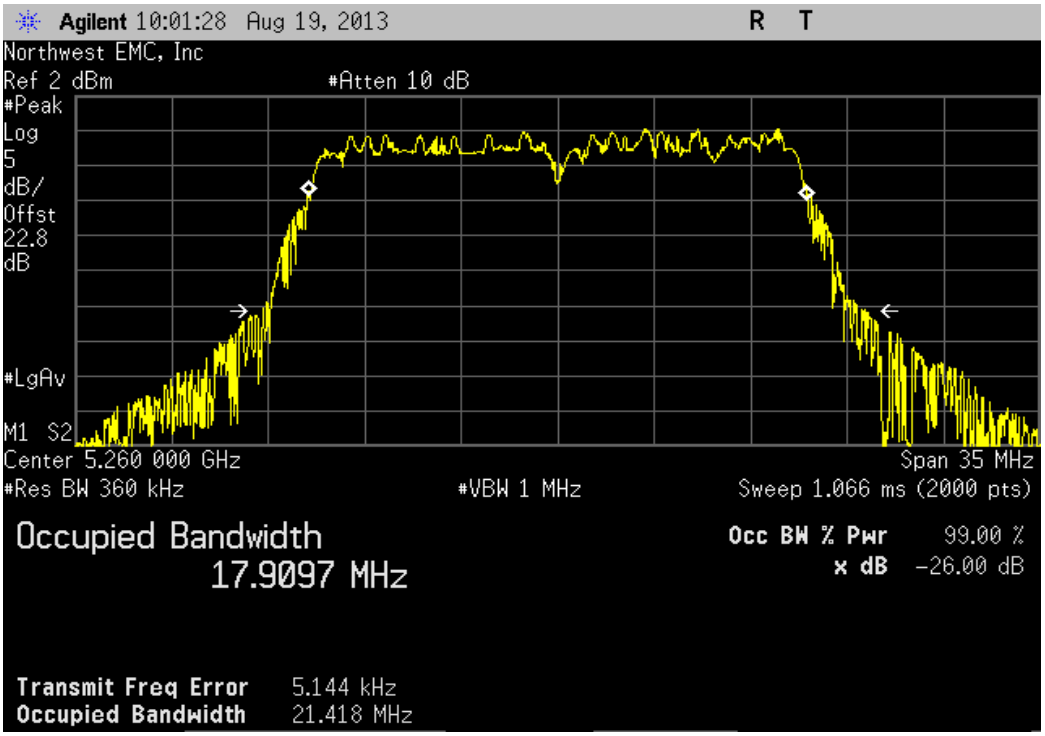
Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.885 MHz	> 500 kHz	Pass



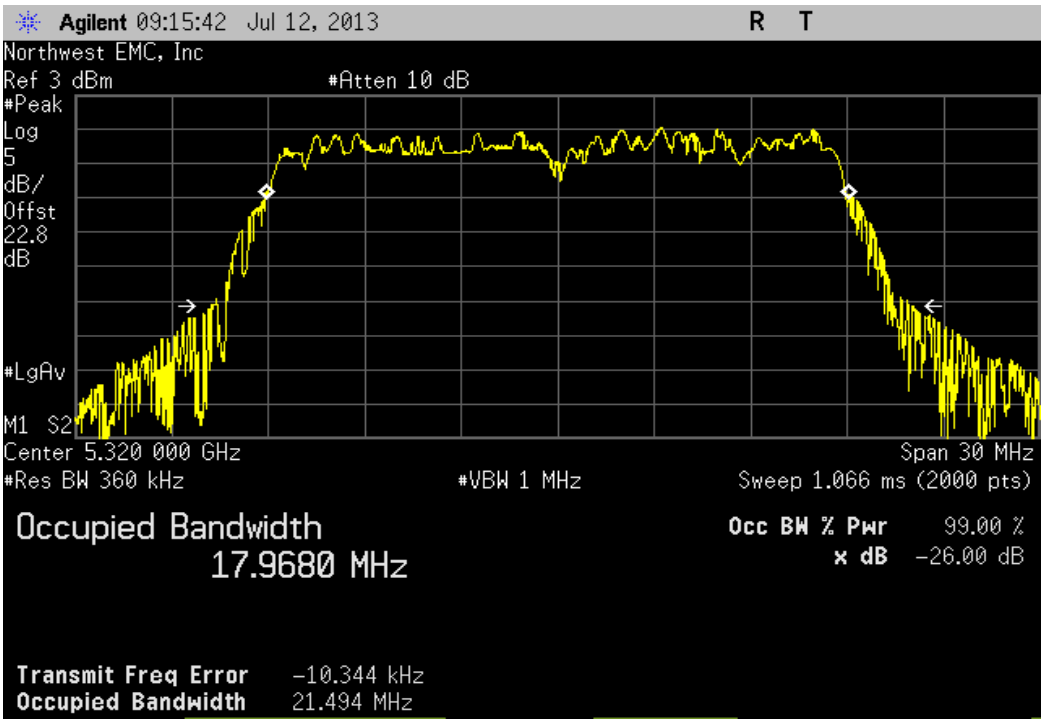
Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.418 MHz	> 500 kHz	Pass

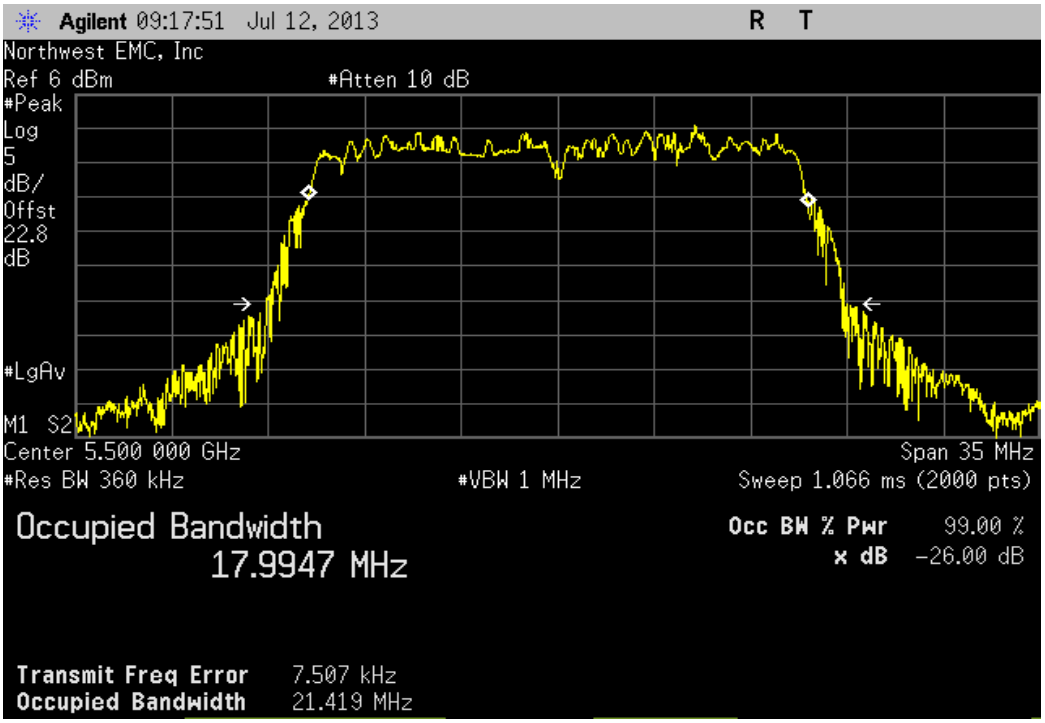


Emission Bandwidth - Antenna A-B

Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				21.494 MHz	> 500 kHz	Pass



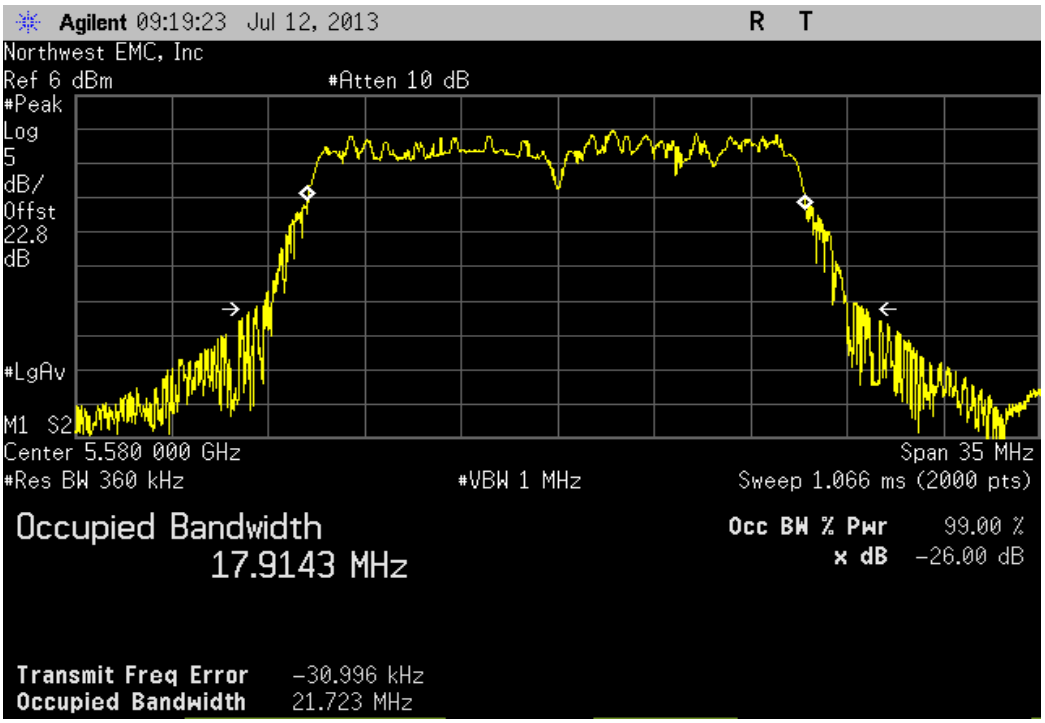
Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				21.419 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

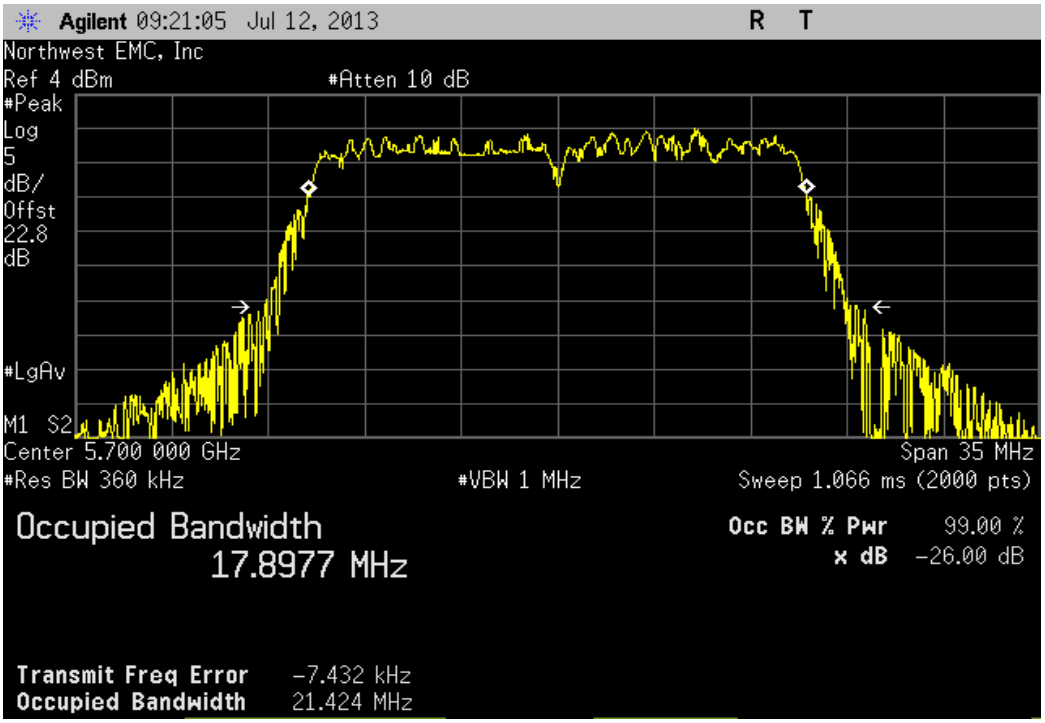
Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.723 MHz	> 500 kHz	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

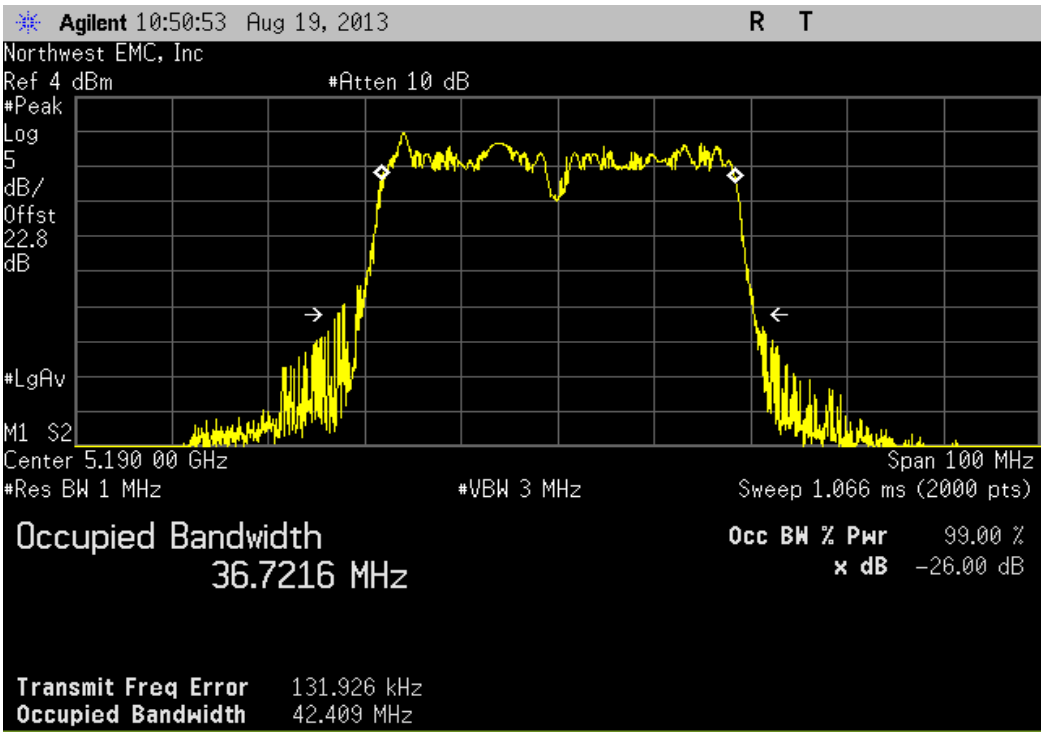
				Value	Limit	Result
				21.424 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

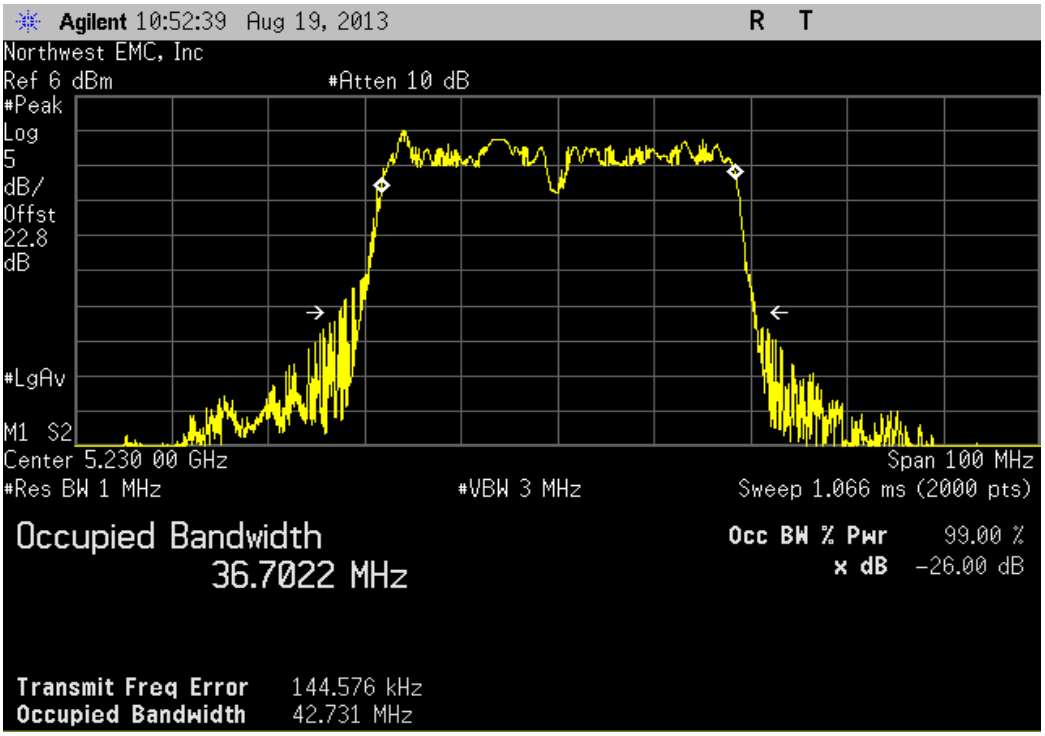
Chain B, 40 MHz, 802.11(n) MCS8, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				42.409 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 44/48, High Channel 5230 MHz

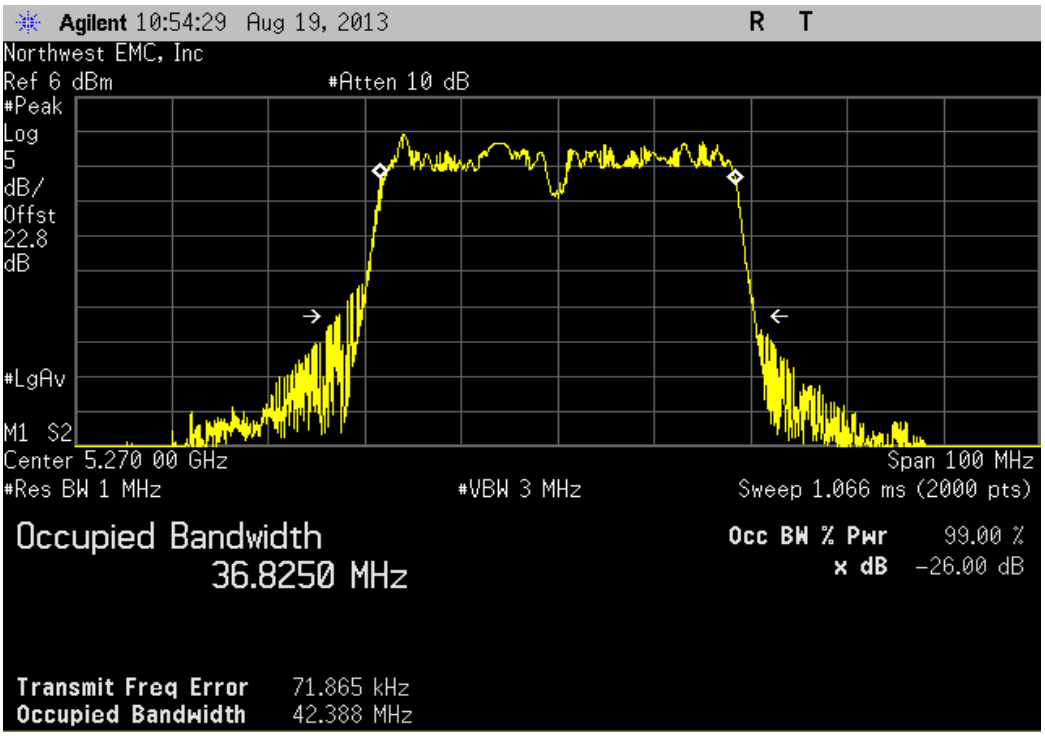
				Value	Limit	Result
				42.731 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

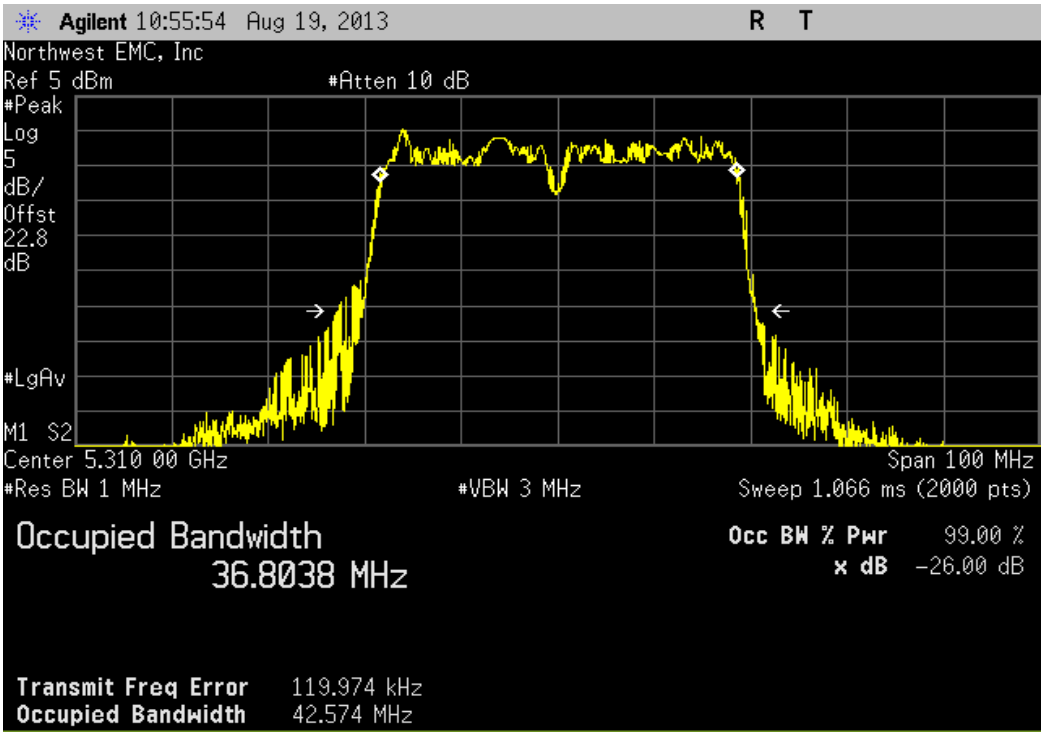
Chain B, 40 MHz, 802.11(n) MCS8, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				42.388 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 60/64, High Channel 5310 MHz

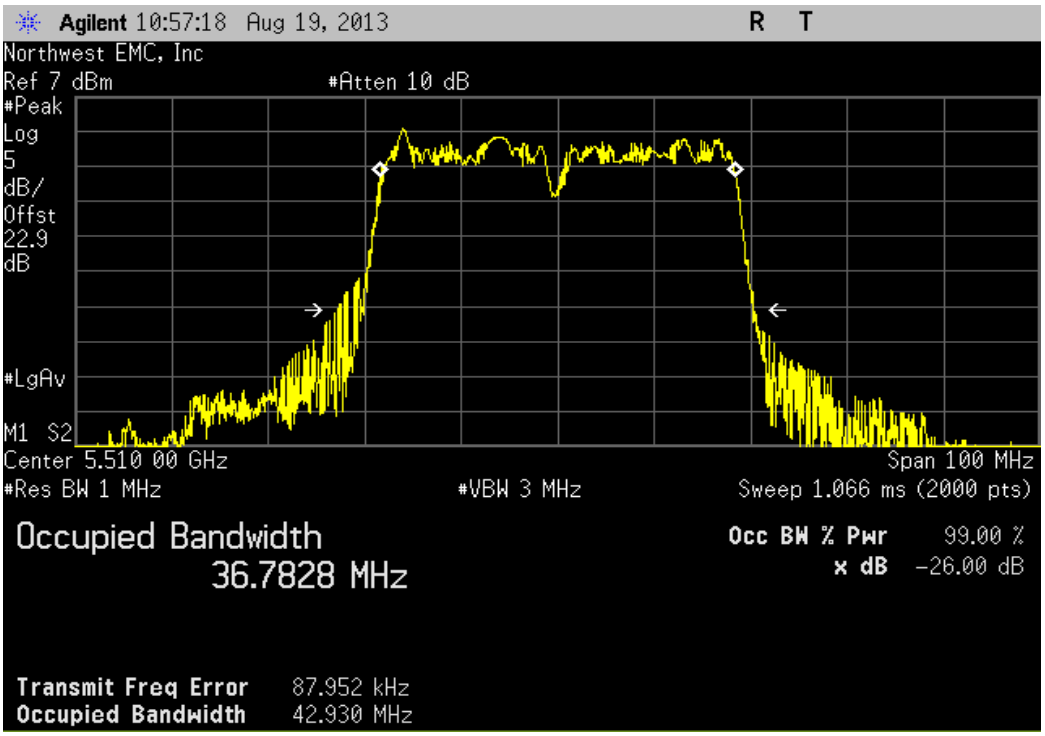
				Value	Limit	Result
				42.574 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

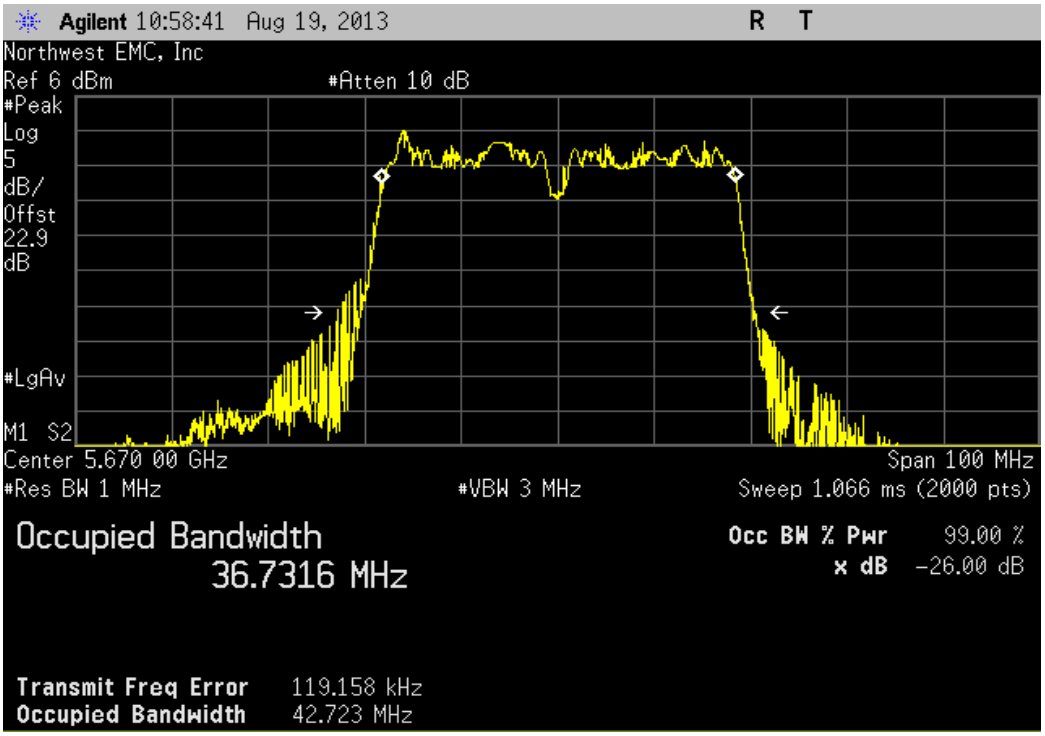
Chain B, 40 MHz, 802.11(n) MCS8, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				42.93 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS8, Ch 132/136, High Channel 5670 MHz

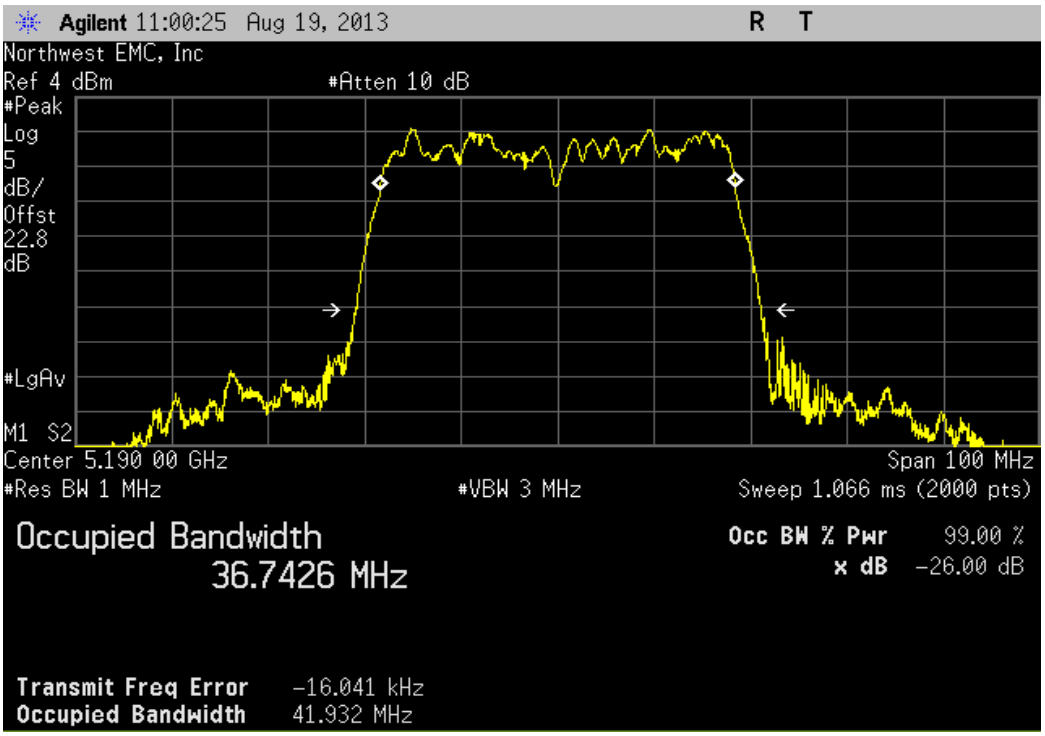
				Value	Limit	Result
				42.723 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

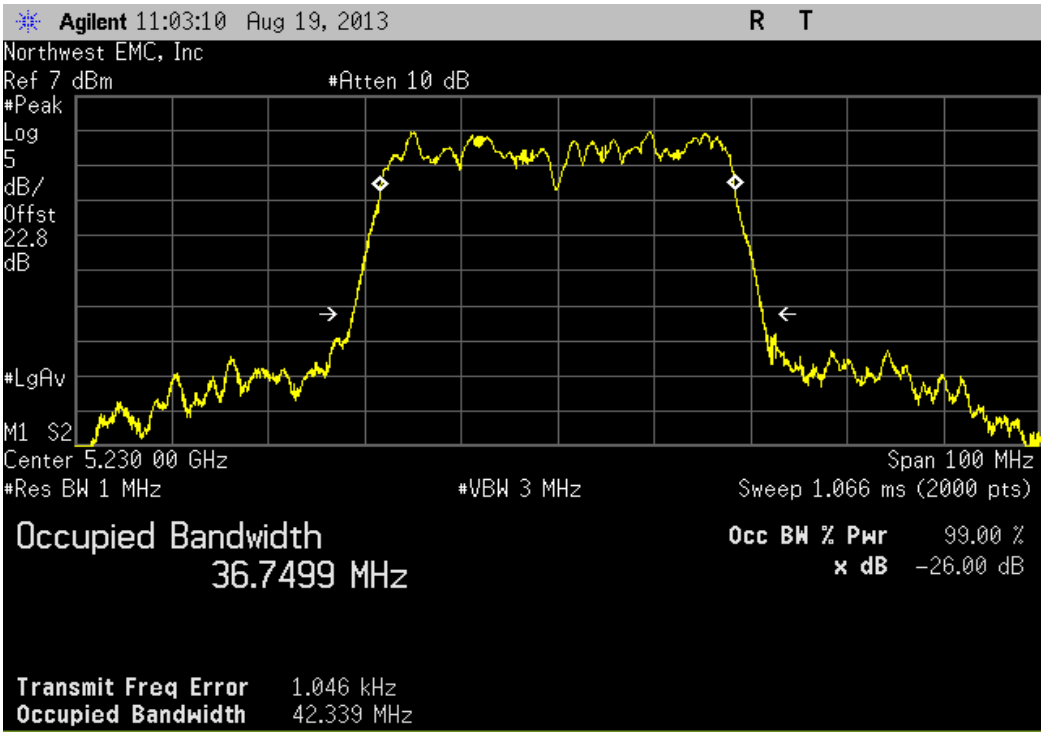
Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				41.932 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

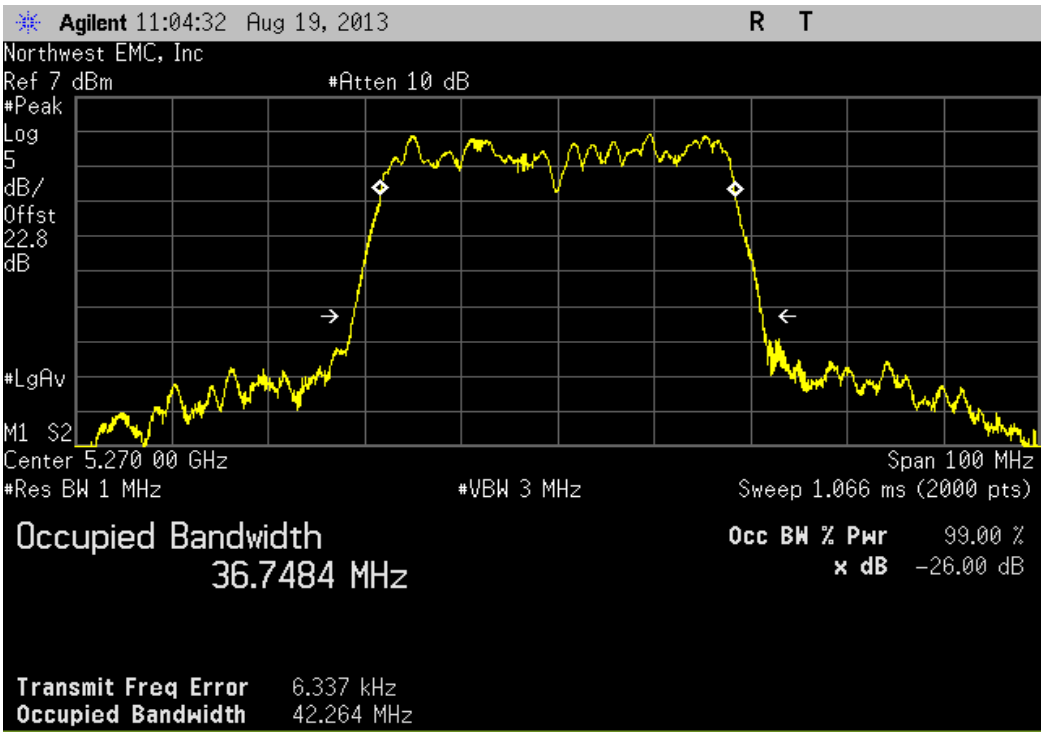
				Value	Limit	Result
				42.339 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

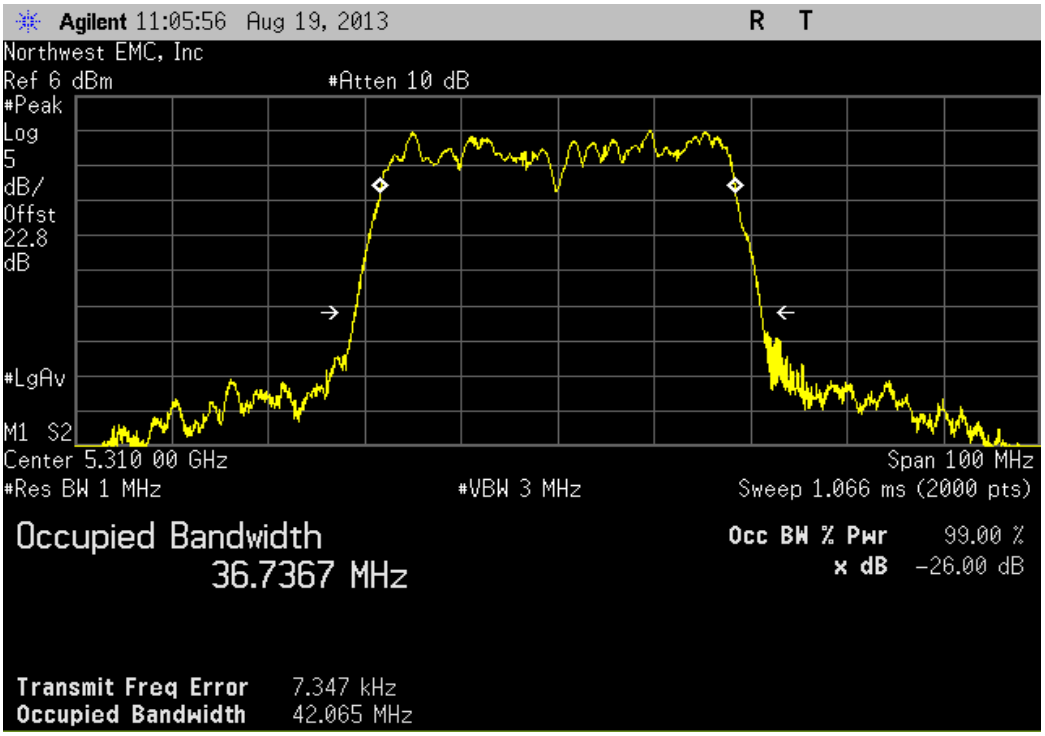
Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				42.264 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

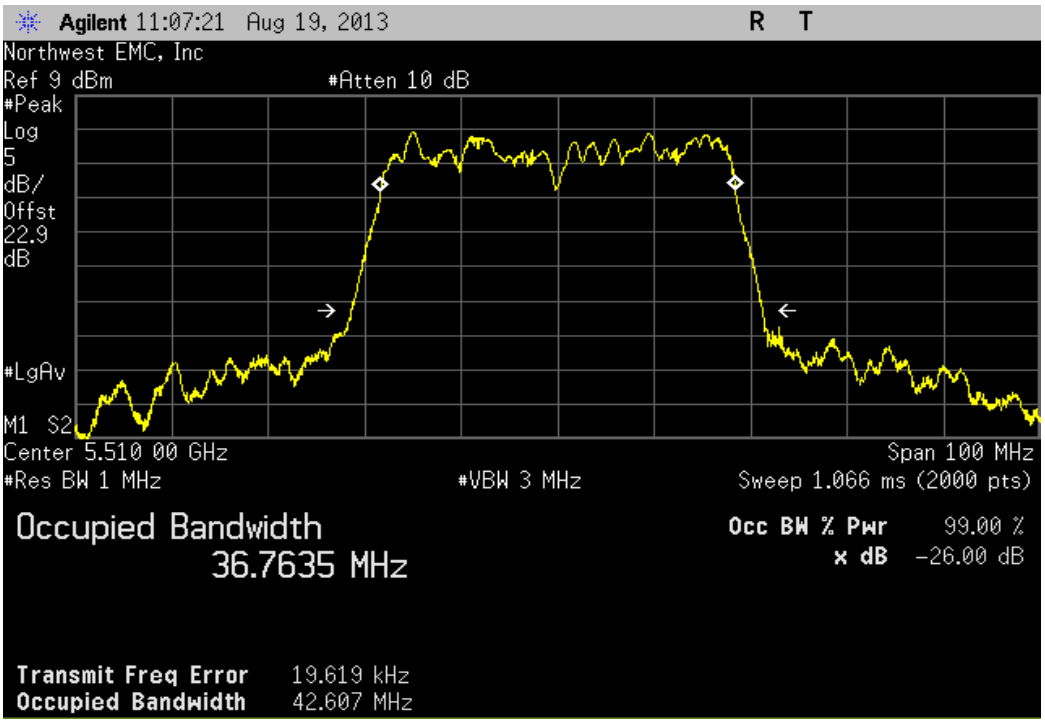
				Value	Limit	Result
				42.065 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A-B

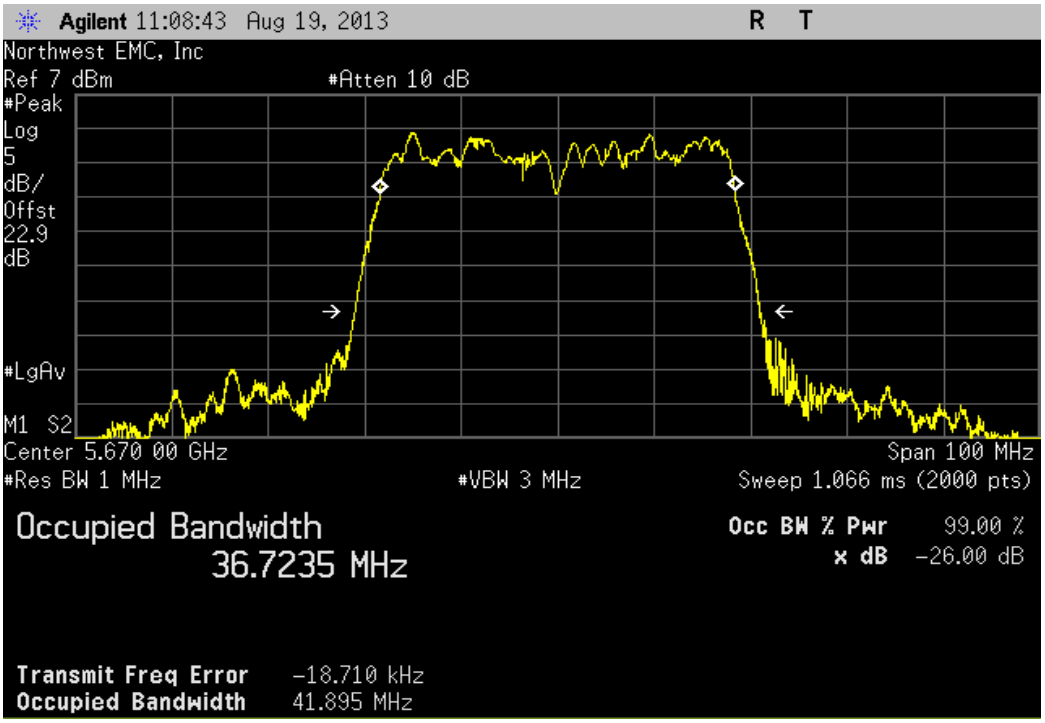
Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				42.607 MHz	> 500 kHz	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.895 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW= > RBW
- A peak detector was used
- Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Emission Bandwidth - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/13/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

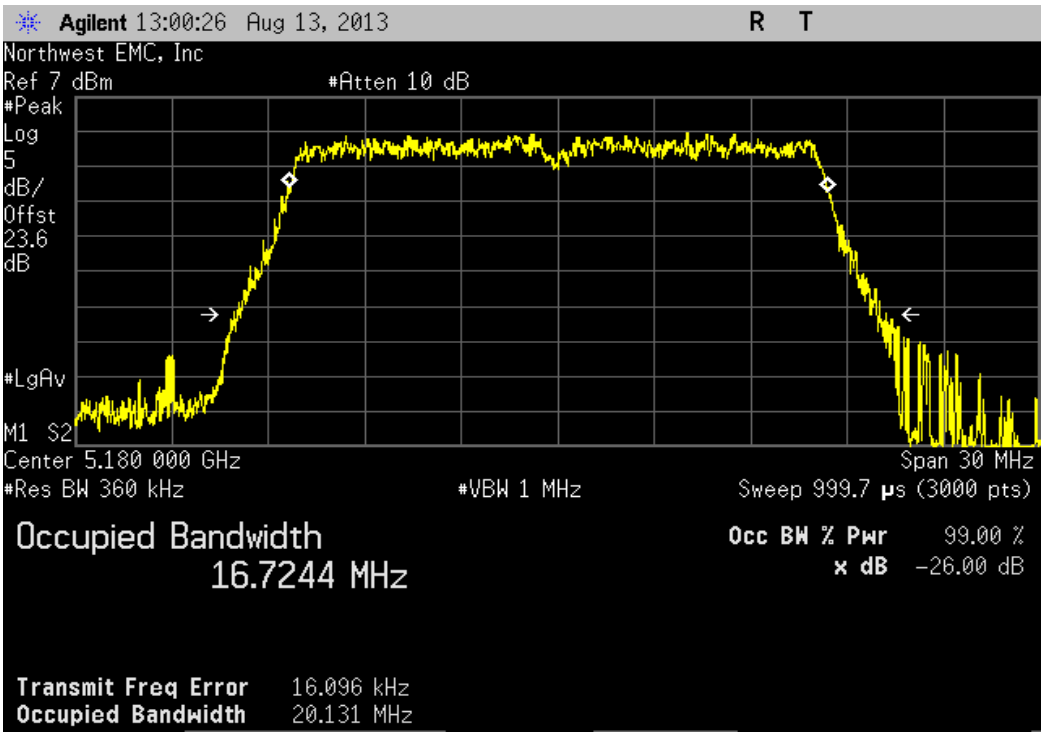
Configuration #	1	Signature

			Value	Limit	Result
20 MHz					
	802.11(a) 6 Mbps				
		Ch 36, Low Channel 5180 MHz	20.131 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	19.982 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	19.962 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	19.823 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	20.11 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	19.899 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	19.983 MHz	> 500 kHz	Pass
	802.11(a) 36 Mbps				
		Ch 36, Low Channel 5180 MHz	19.964 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	20.042 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	19.971 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	19.982 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	20.072 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	19.989 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	19.97 MHz	> 500 kHz	Pass
	802.11(a) 54 Mbps				
		Ch 36, Low Channel 5180 MHz	20.041 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	19.989 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	20.003 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	20.073 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	20.046 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	20.004 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	20.059 MHz	> 500 kHz	Pass
	802.11(n) MCS0				
		Ch 36, Low Channel 5180 MHz	21.904 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	22.325 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	21.751 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	22.32 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	22.197 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	22.159 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	22.019 MHz	> 500 kHz	Pass
	802.11(n) MCS7				
		Ch 36, Low Channel 5180 MHz	22.232 MHz	> 500 kHz	Pass
		Ch 48, High Channel 5240 MHz	22.083 MHz	> 500 kHz	Pass
		Ch 52, Low Channel 5260 MHz	21.894 MHz	> 500 kHz	Pass
		Ch 64, High Channel 5320 MHz	22.397 MHz	> 500 kHz	Pass
		Ch 100, Low Channel 5500 MHz	21.926 MHz	> 500 kHz	Pass
		Ch 116, Mid Channel 5580 MHz	22.058 MHz	> 500 kHz	Pass
		Ch 140, High Channel 5700 MHz	21.846 MHz	> 500 kHz	Pass
40 MHz					
	802.11(n) MCS0				
		Ch 36/40, Low Channel 5190 MHz	41.38 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	41.205 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	41.199 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	41.565 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	41.109 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	41.398 MHz	> 500 kHz	Pass
	802.11(n) MCS7				
		Ch 36/40, Low Channel 5190 MHz	41.293 MHz	> 500 kHz	Pass
		Ch 44/48, High Channel 5230 MHz	41.616 MHz	> 500 kHz	Pass
		Ch 52/56, Low Channel 5270 MHz	41.288 MHz	> 500 kHz	Pass
		Ch 60/64, High Channel 5310 MHz	41.336 MHz	> 500 kHz	Pass
		Ch 100/104, Low Channel 5510 MHz	41.372 MHz	> 500 kHz	Pass
		Ch 132/136, High Channel 5670 MHz	41.258 MHz	> 500 kHz	Pass

Emission Bandwidth - Antenna A

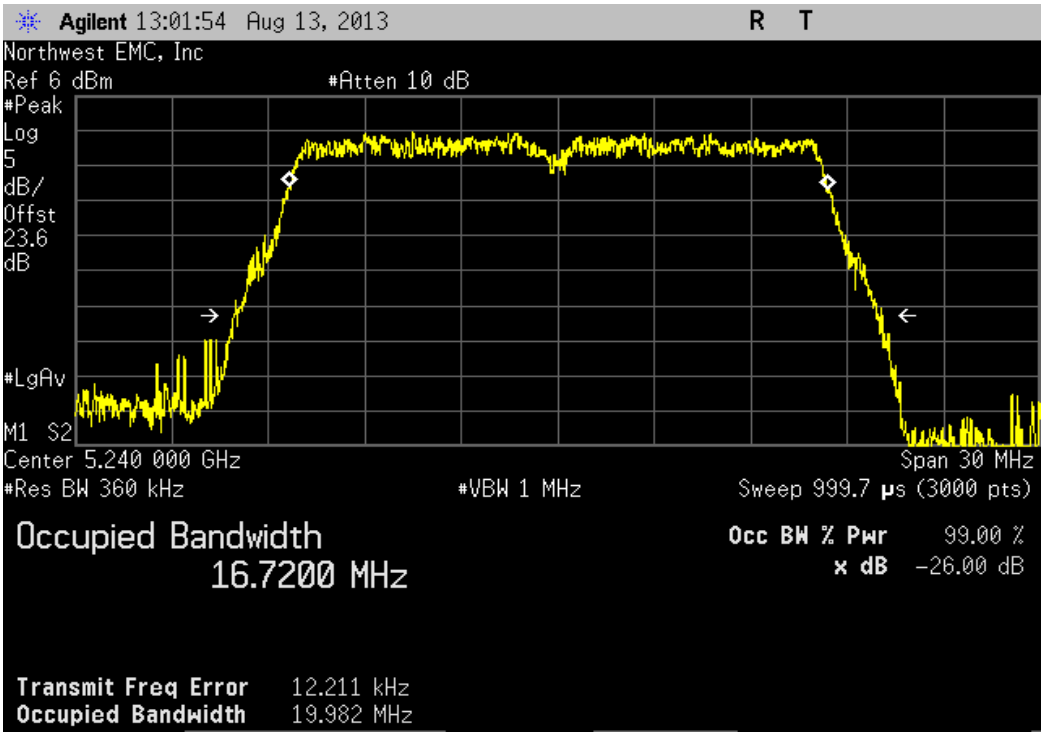
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				20.131 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

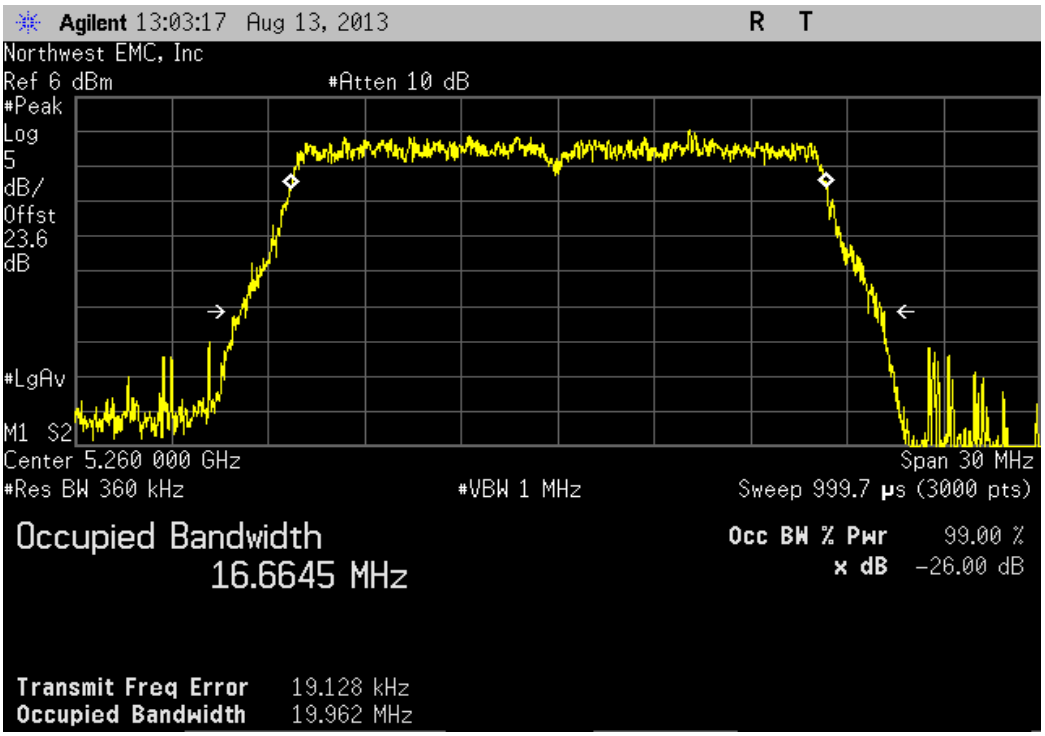
				Value	Limit	Result
				19.982 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

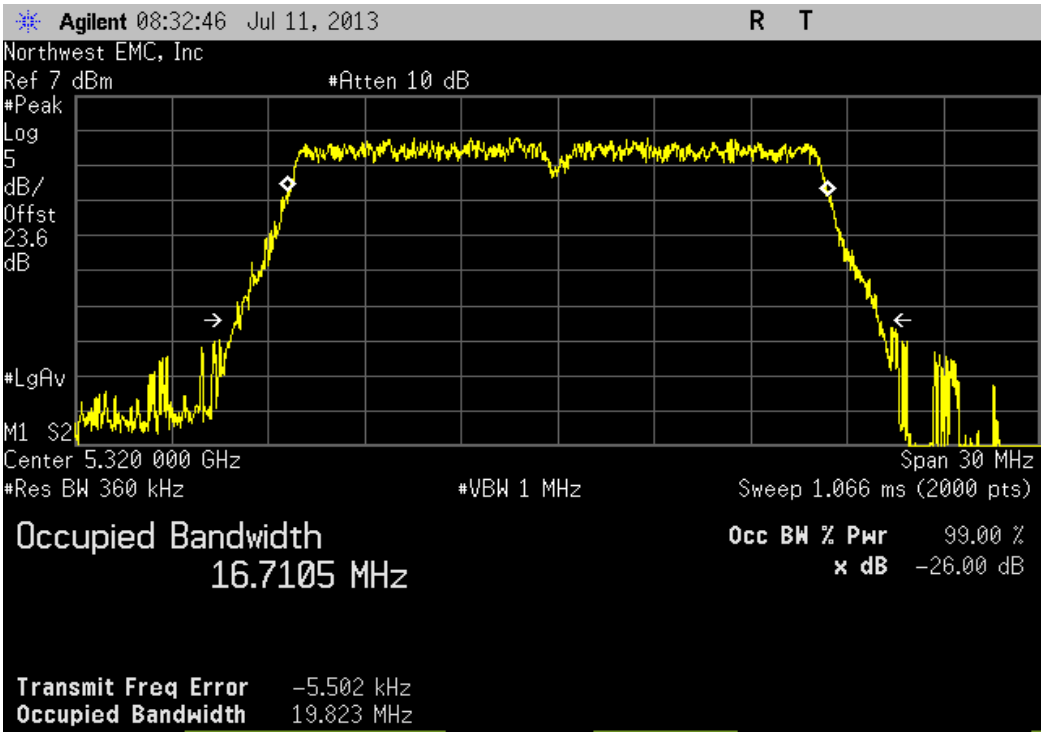
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.962 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

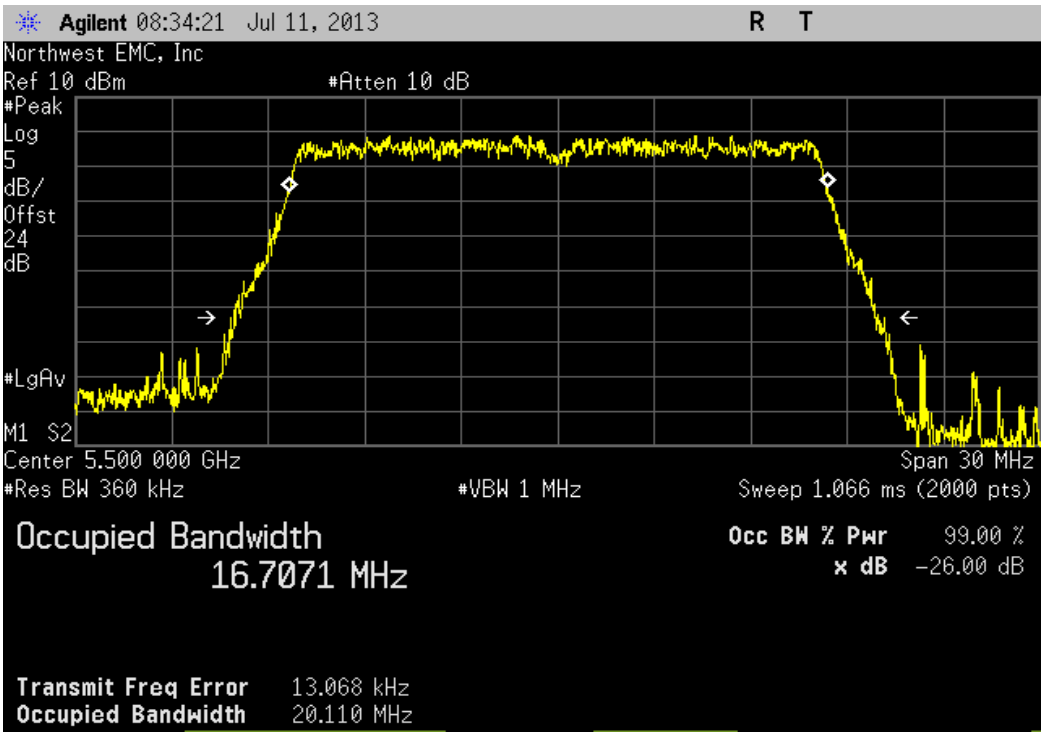
				Value	Limit	Result
				19.823 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

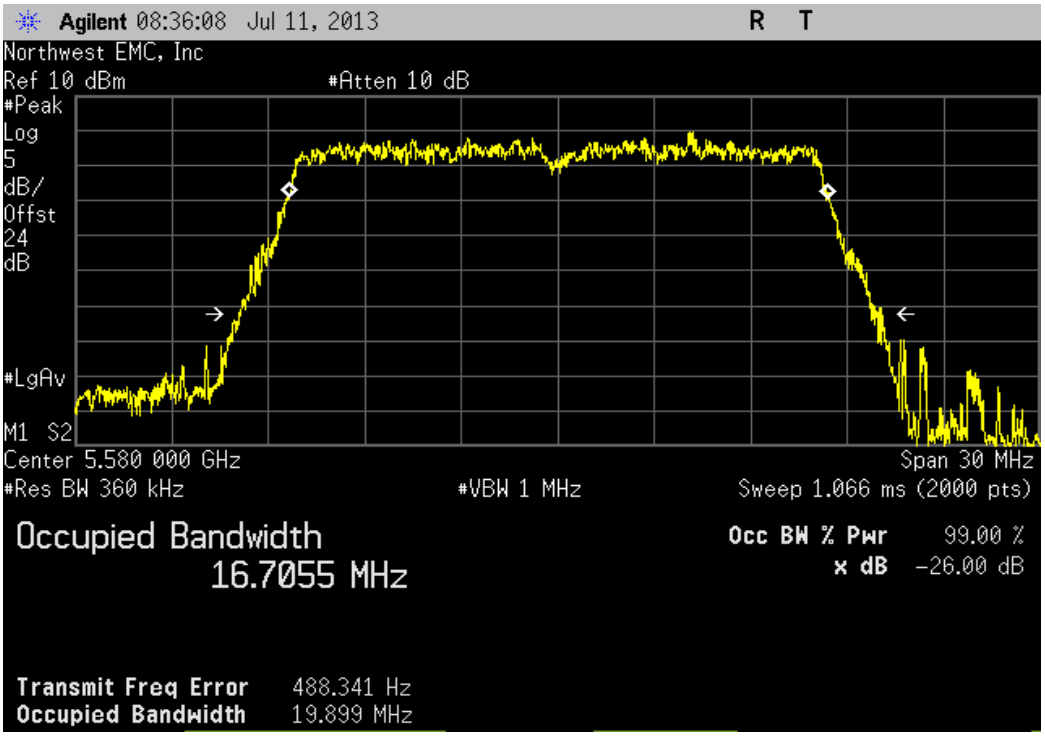
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				20.11 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

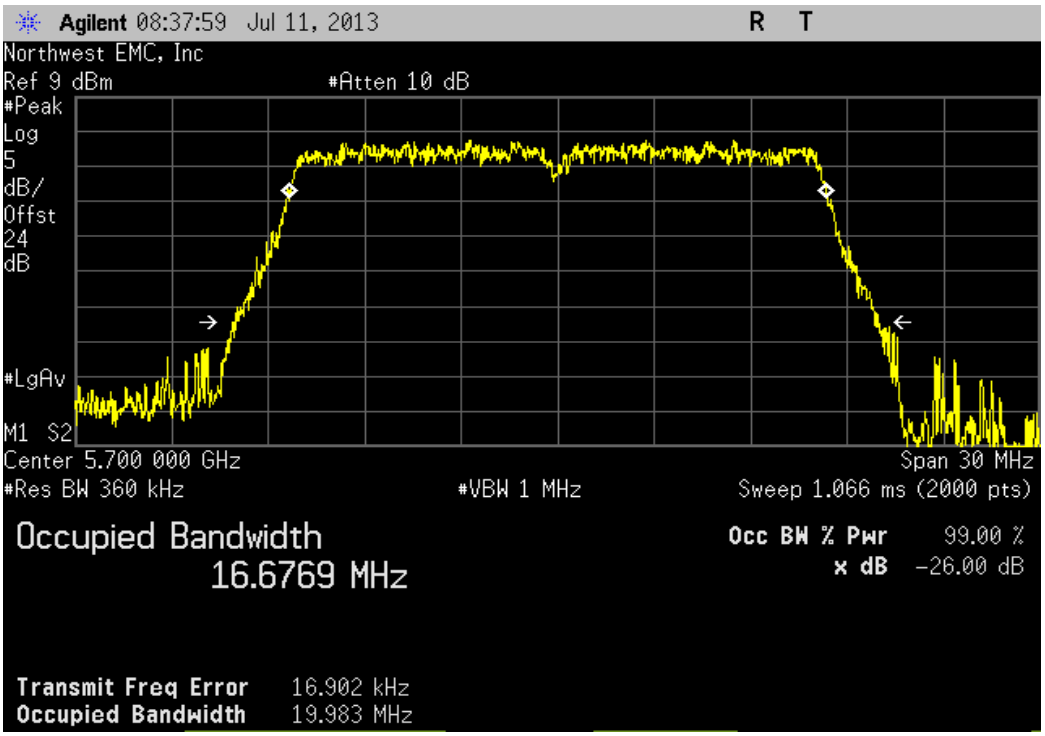
				Value	Limit	Result
				19.899 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

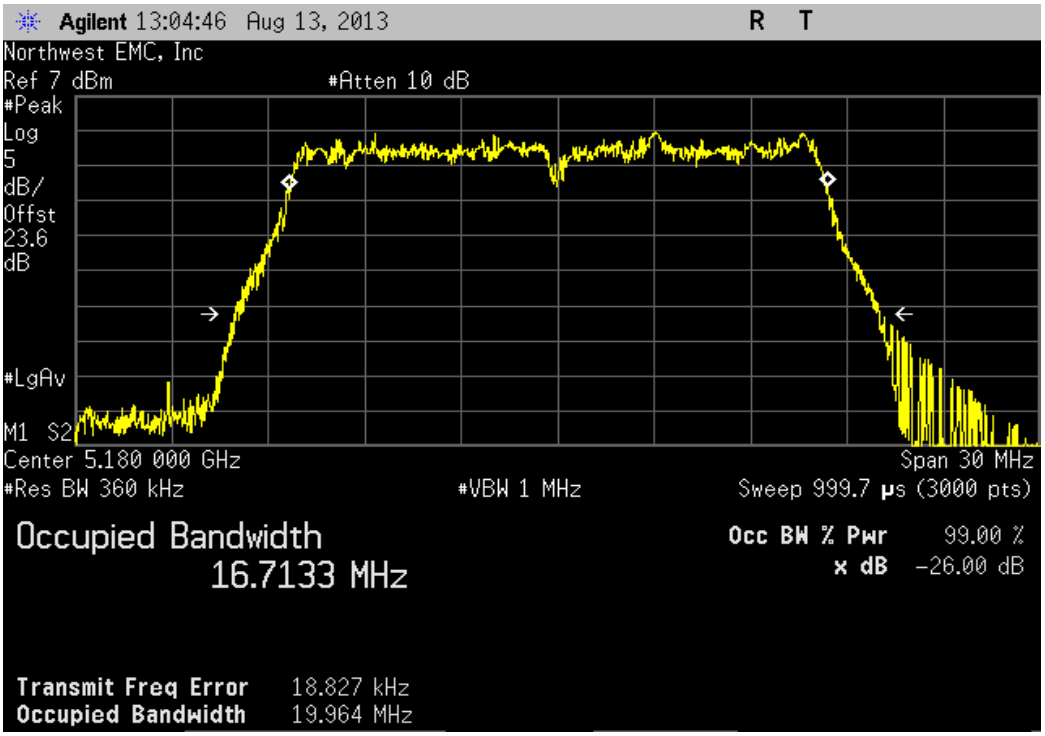
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				19.983 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

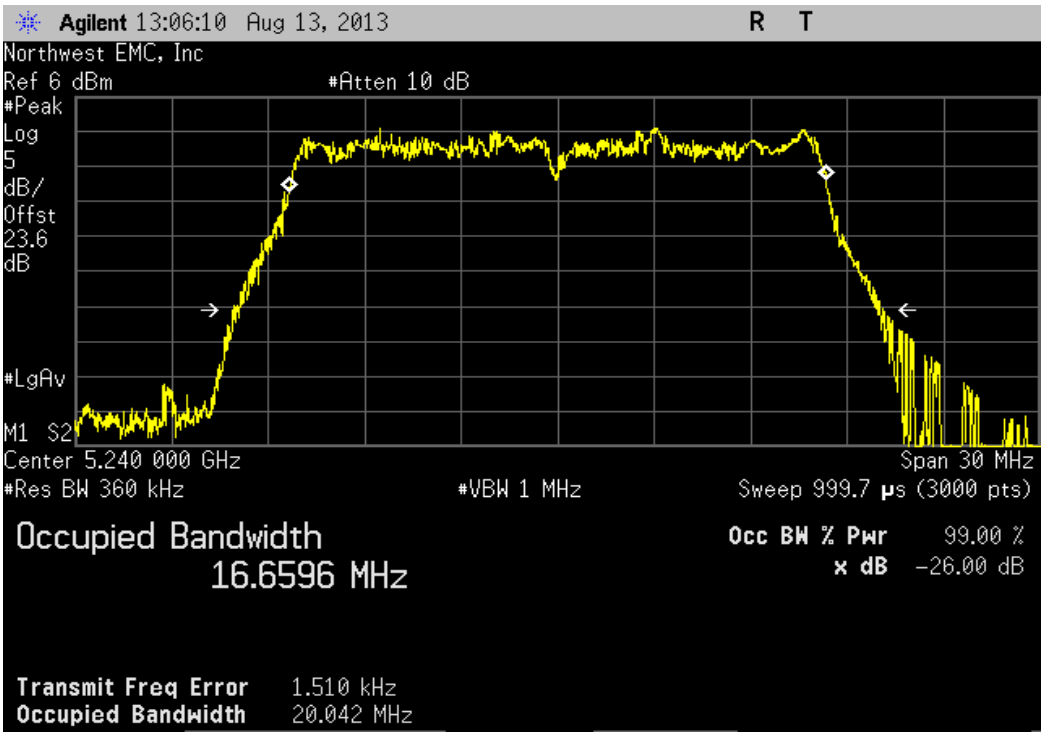
				Value	Limit	Result
				19.964 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

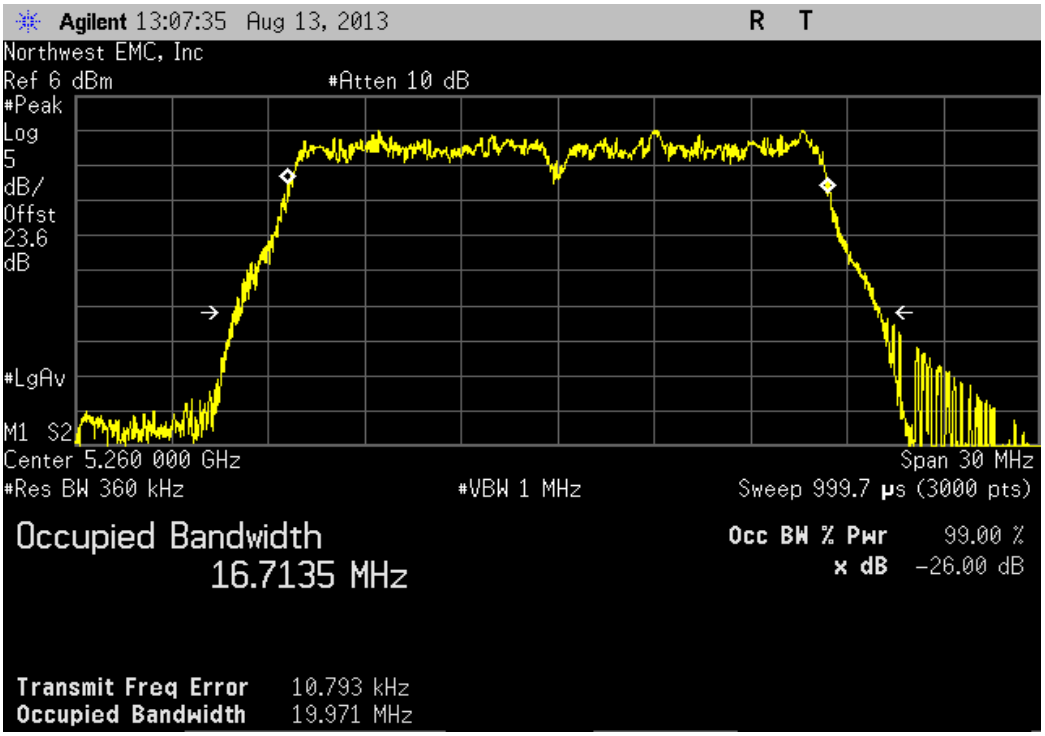
20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				20.042 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz

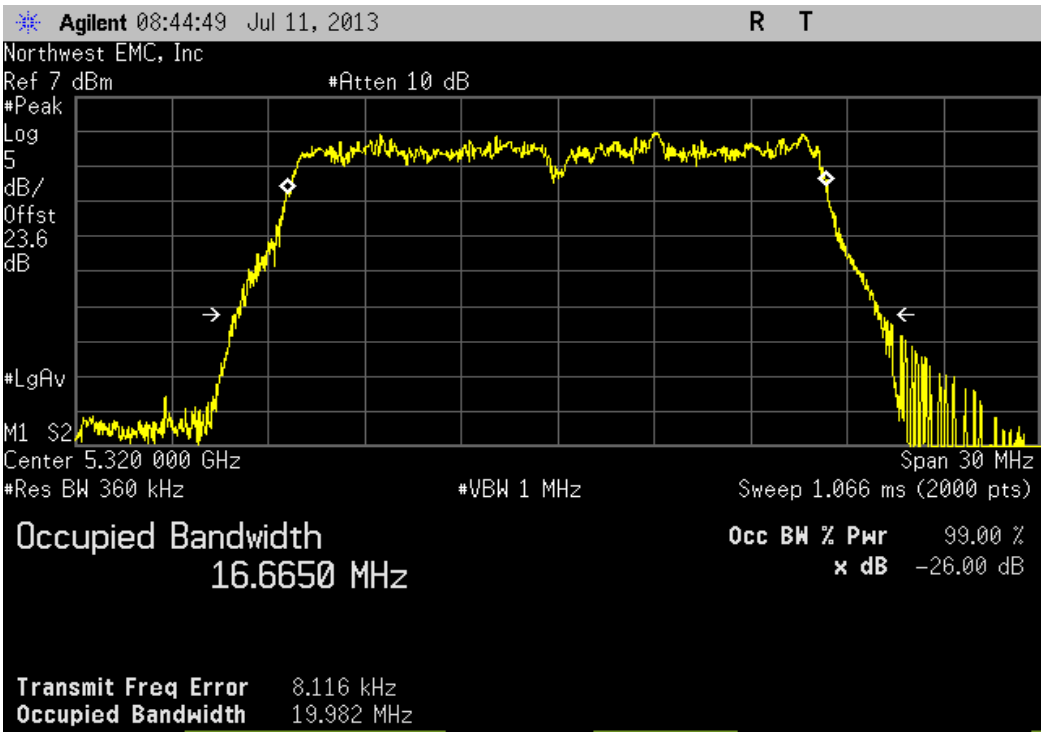
				Value	Limit	Result
				19.971 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

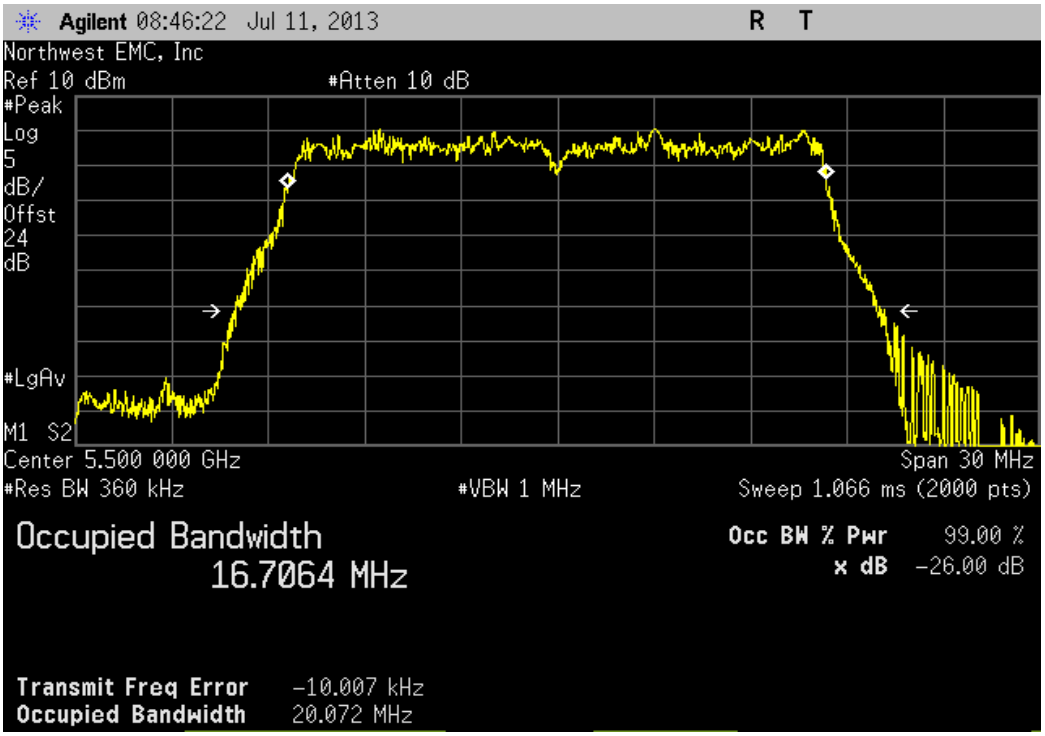
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				19.982 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

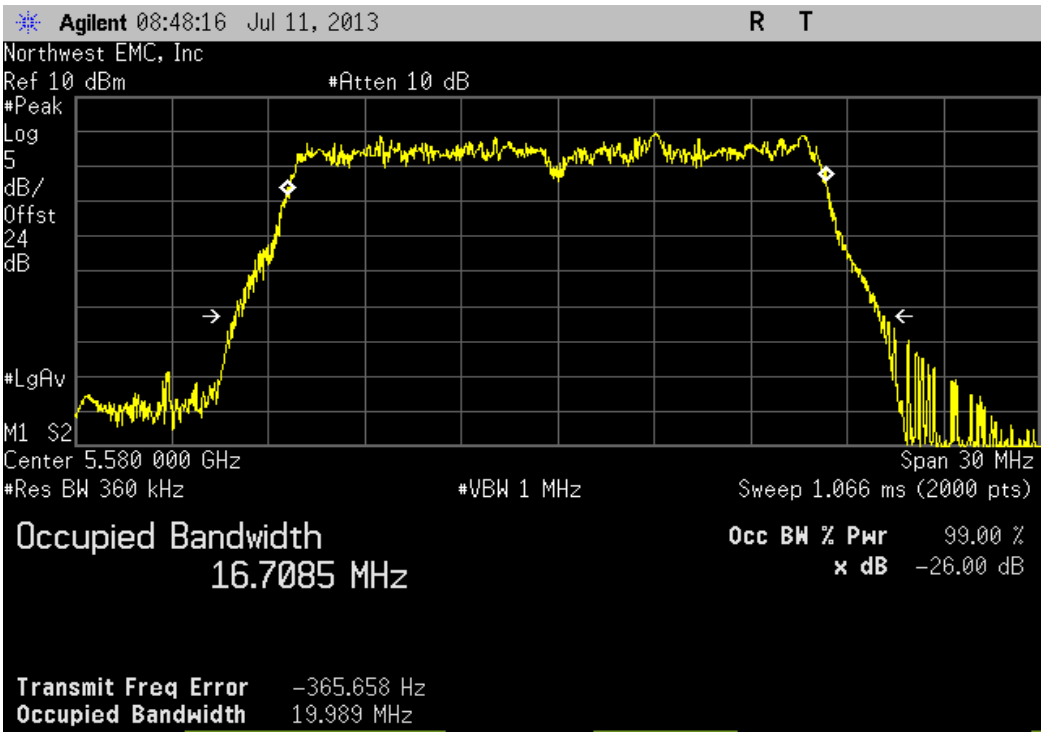
				Value	Limit	Result
				20.072 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

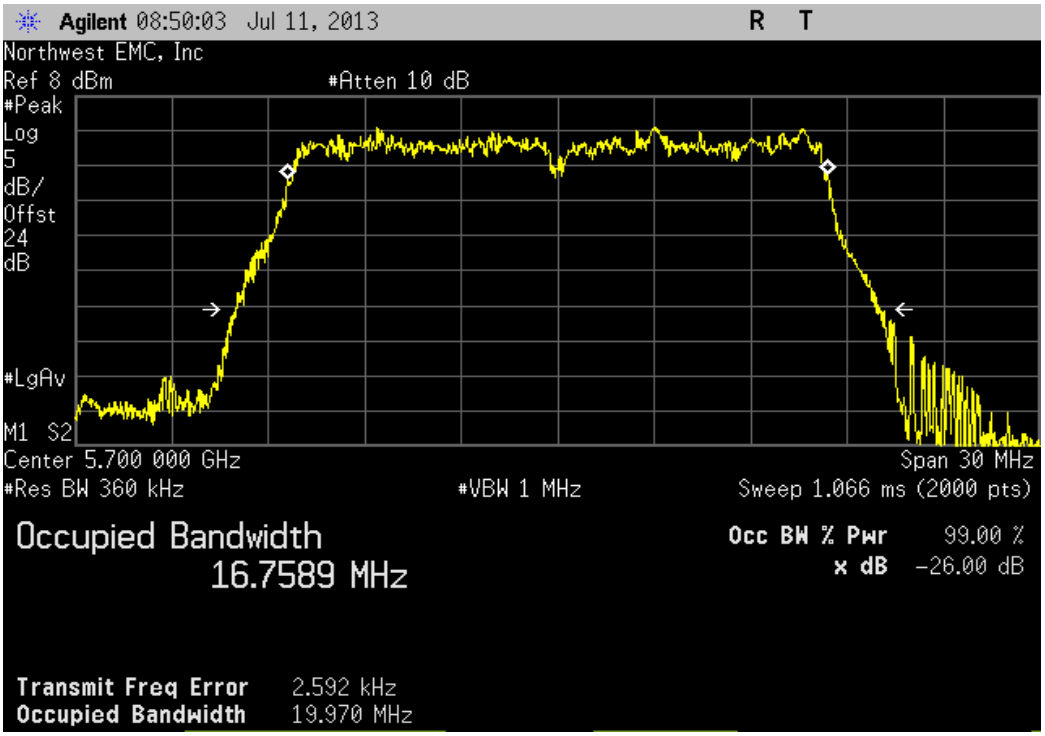
20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.989 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz

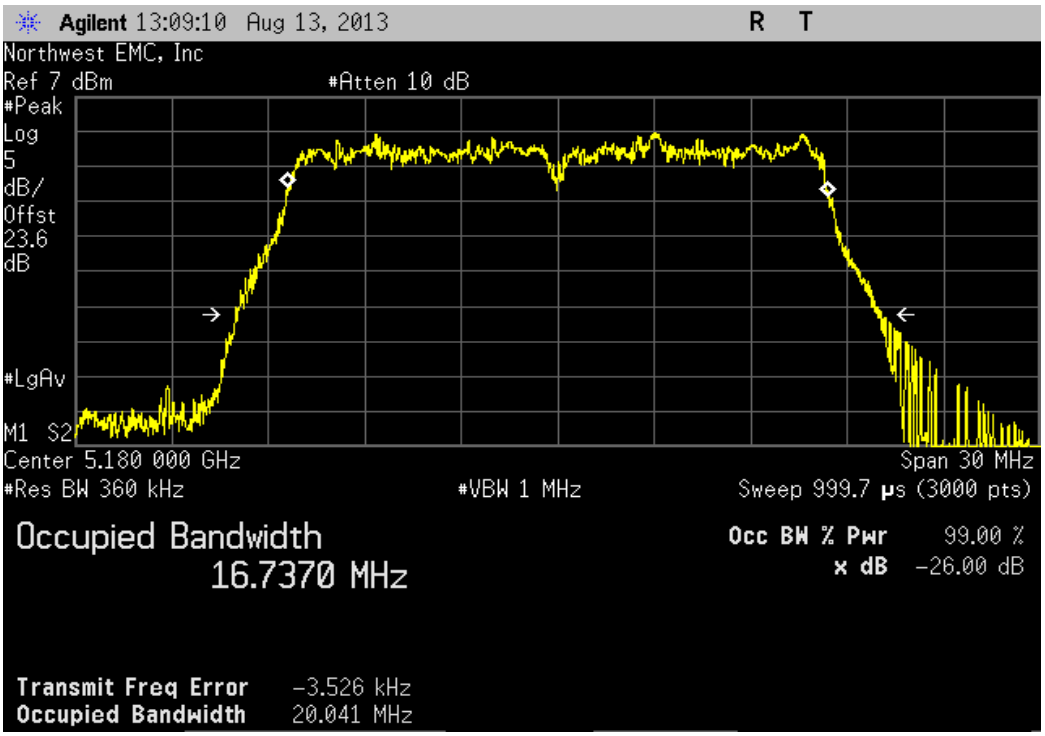
				Value	Limit	Result
				19.97 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

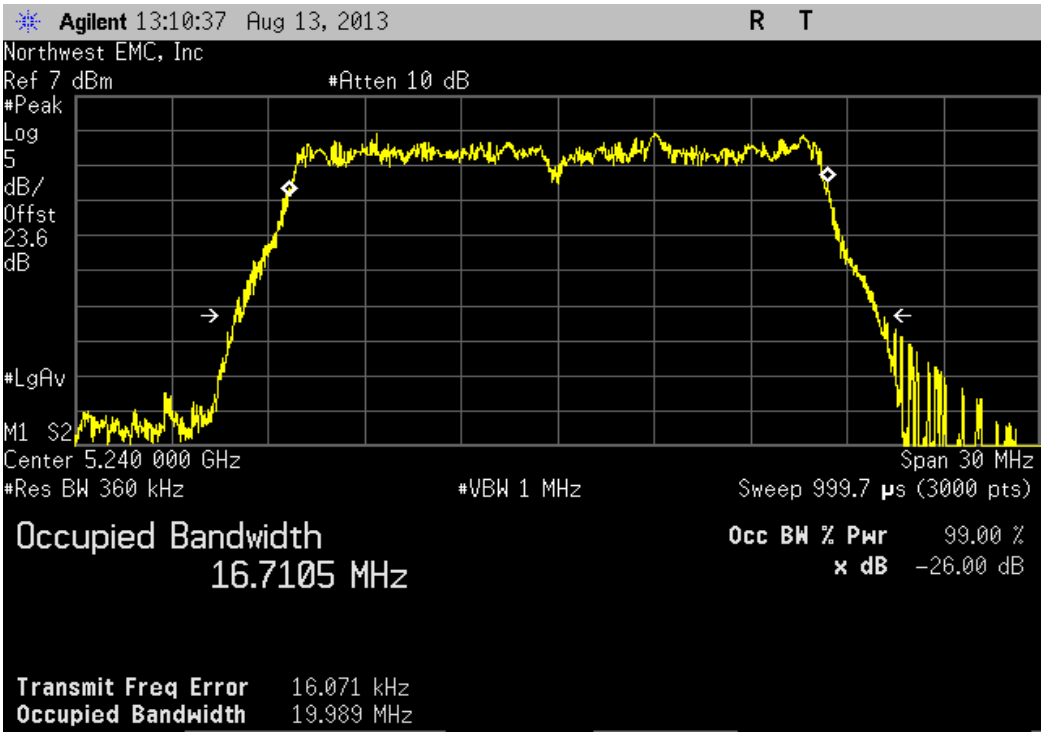
20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				20.041 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz

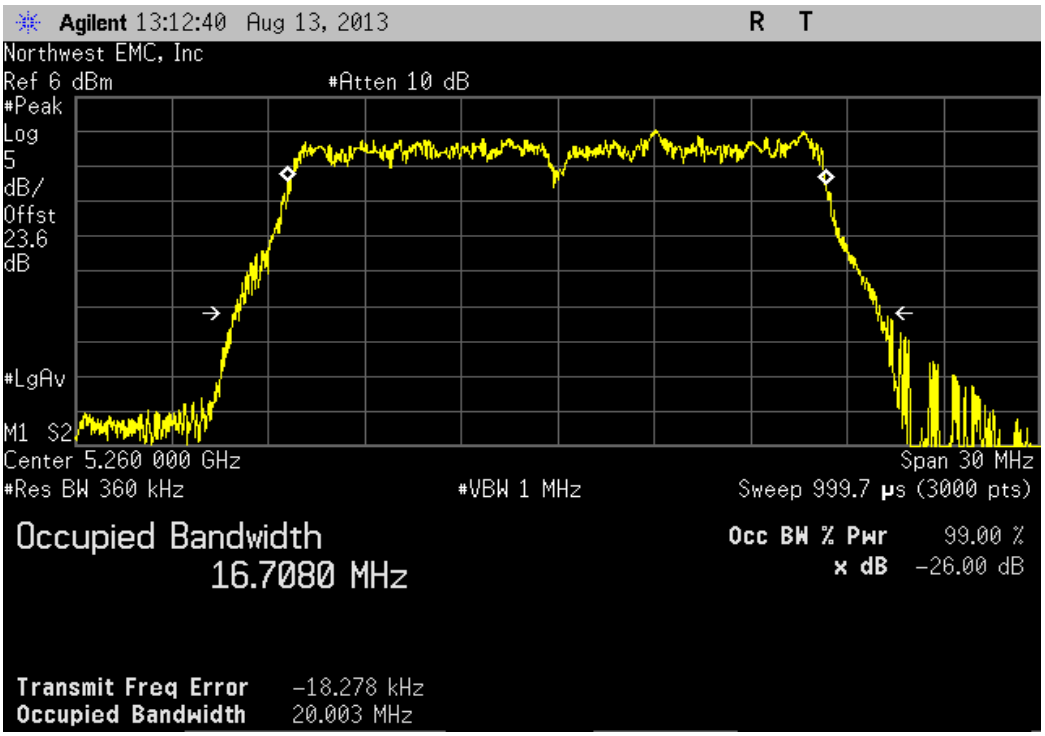
				Value	Limit	Result
				19.989 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

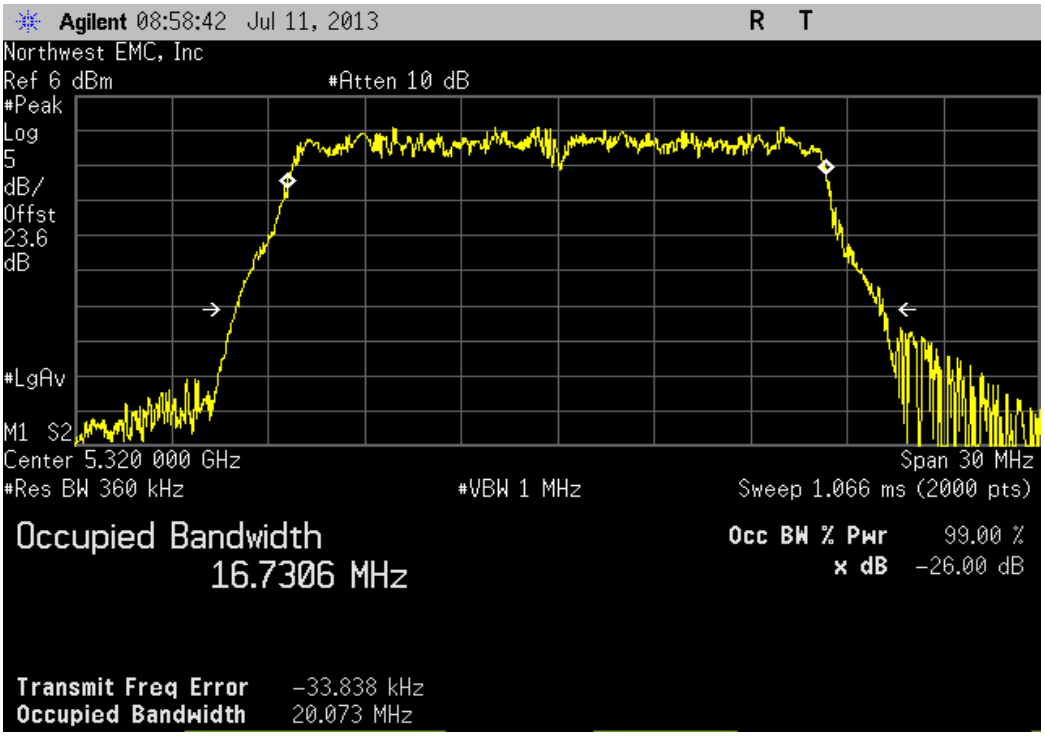
20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				20.003 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz

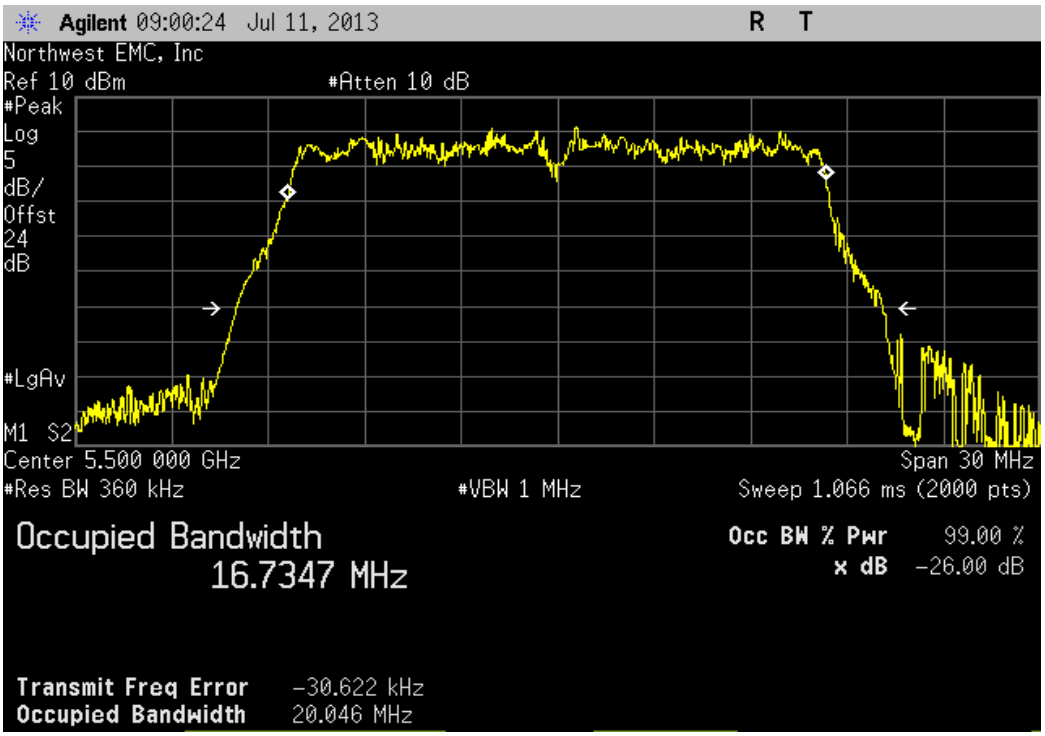
				Value	Limit	Result
				20.073 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

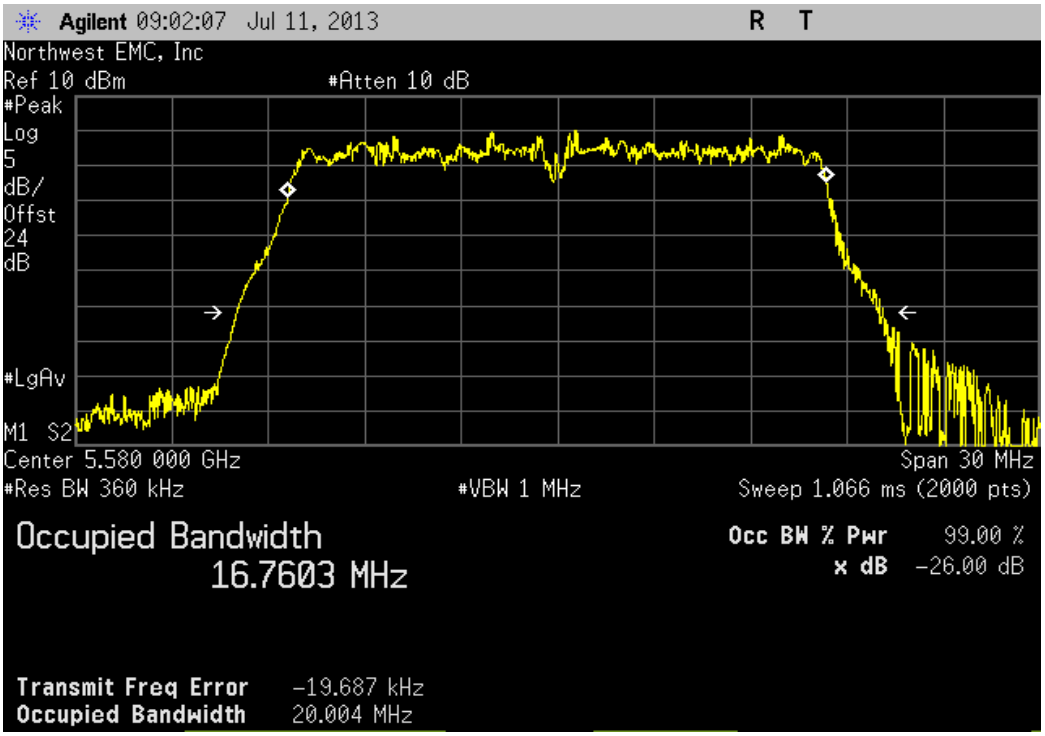
20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				20.046 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz

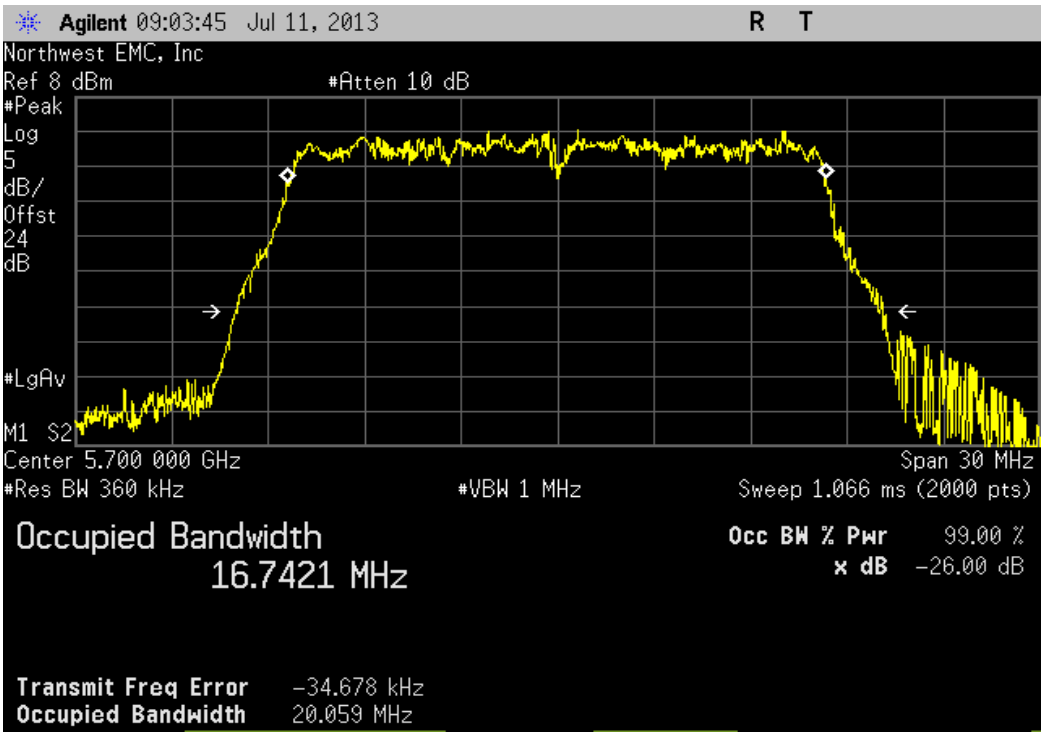
				Value	Limit	Result
				20.004 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

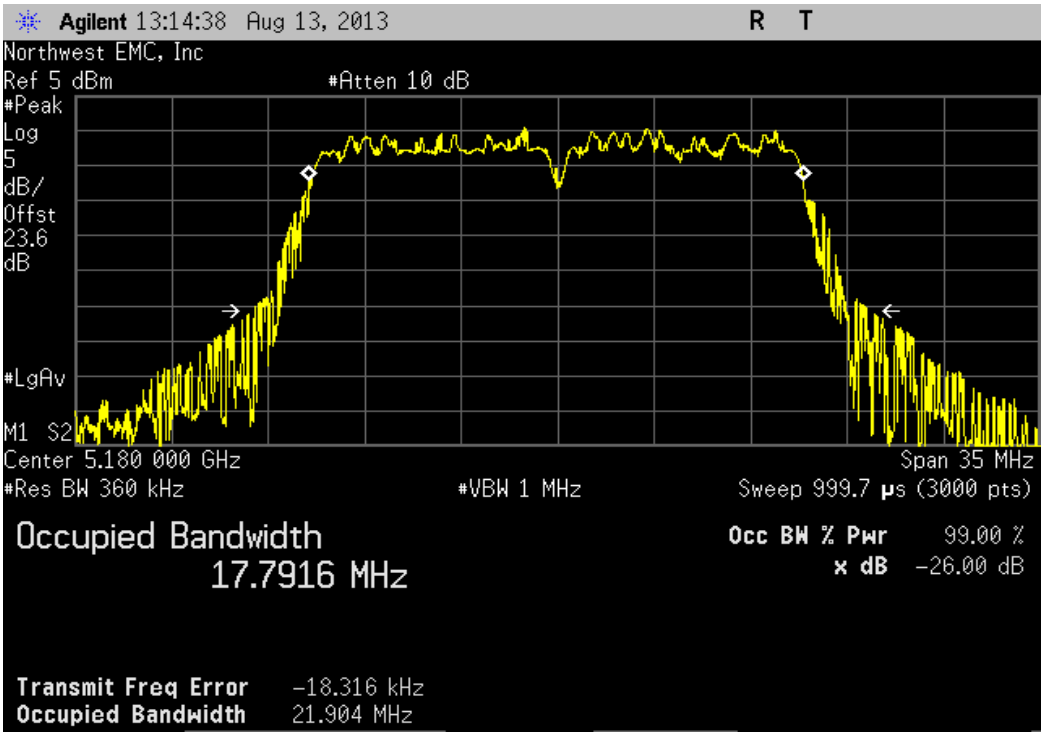
20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				20.059 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

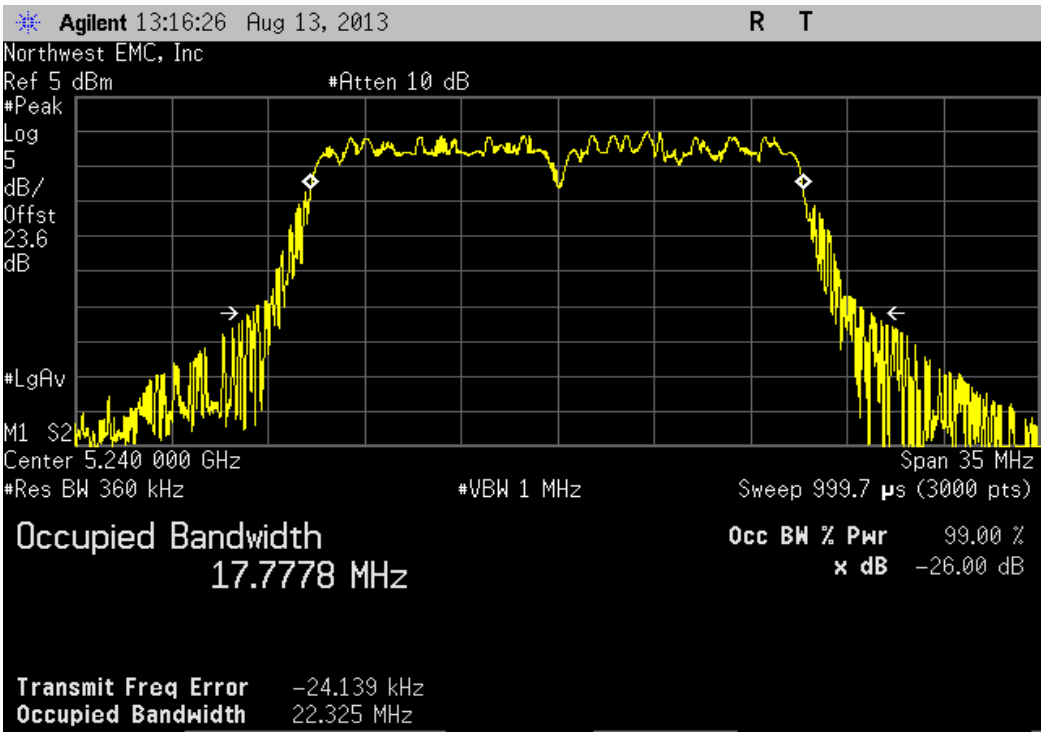
				Value	Limit	Result
				21.904 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

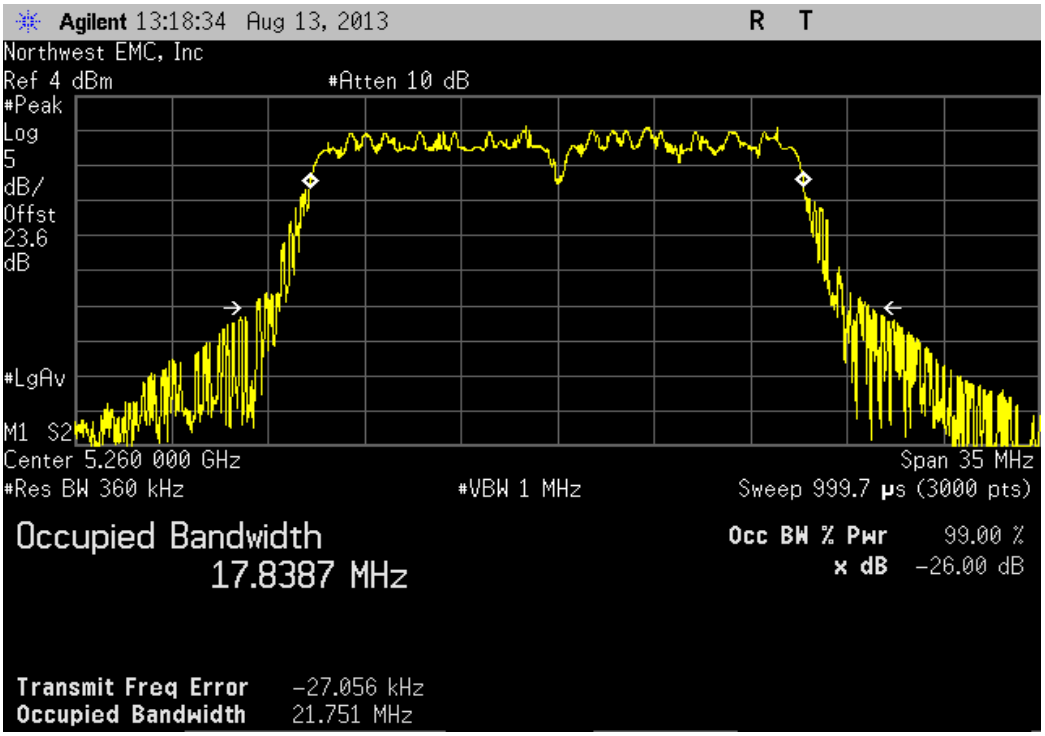
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				22.325 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

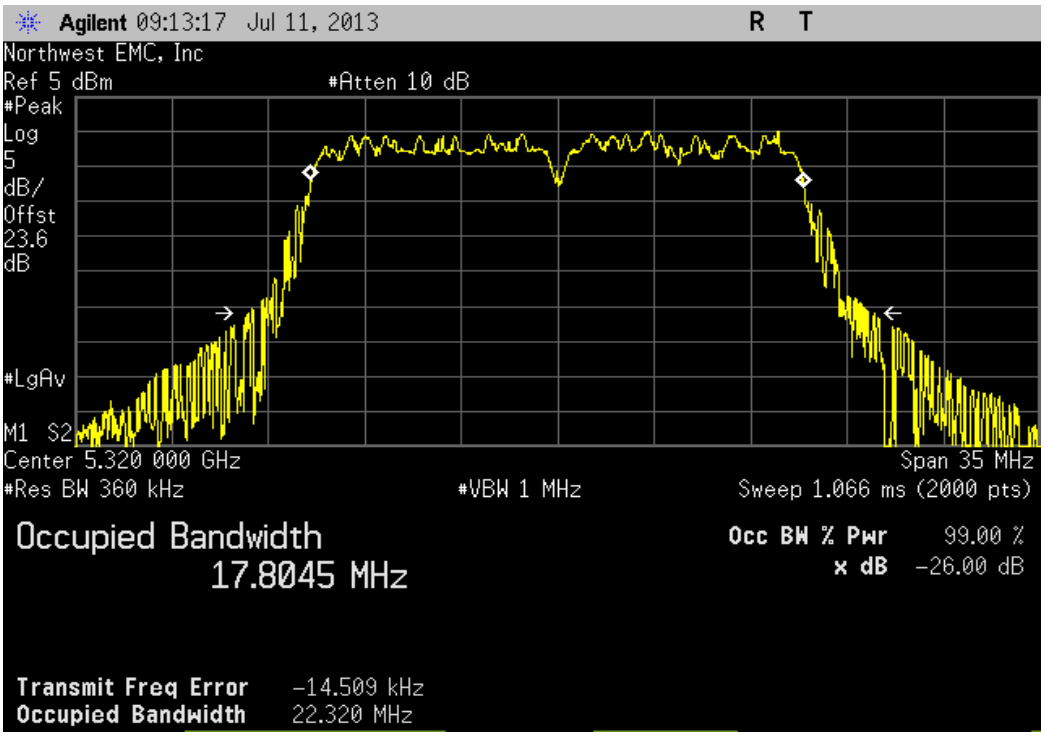
				Value	Limit	Result
				21.751 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

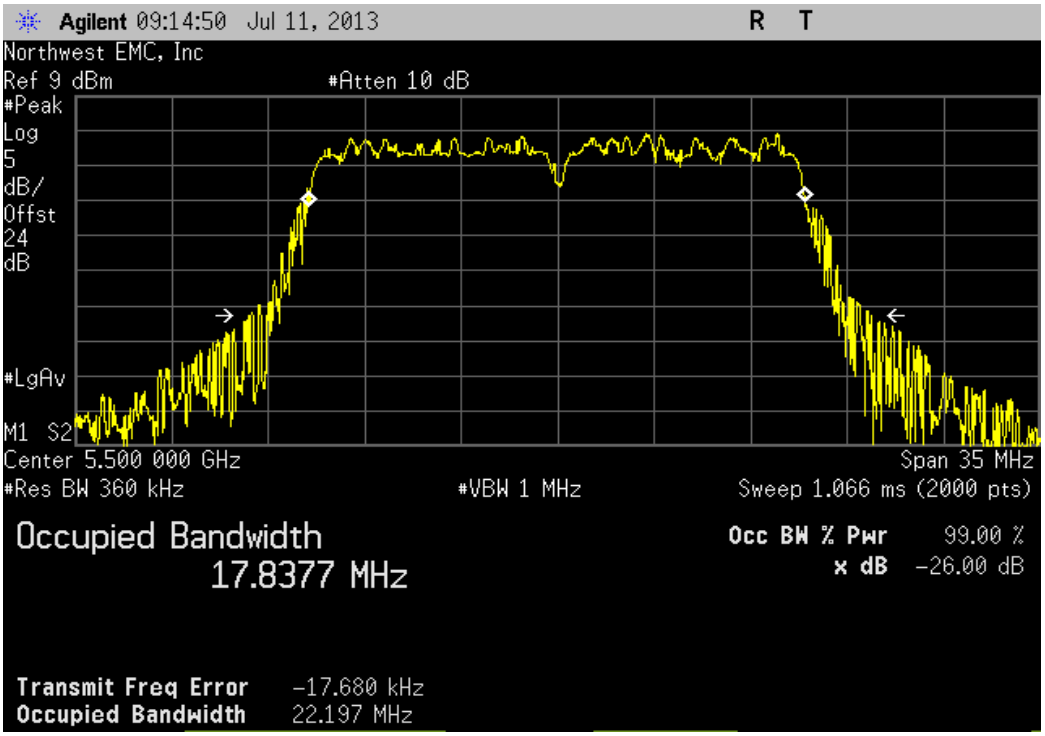
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				22.32 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

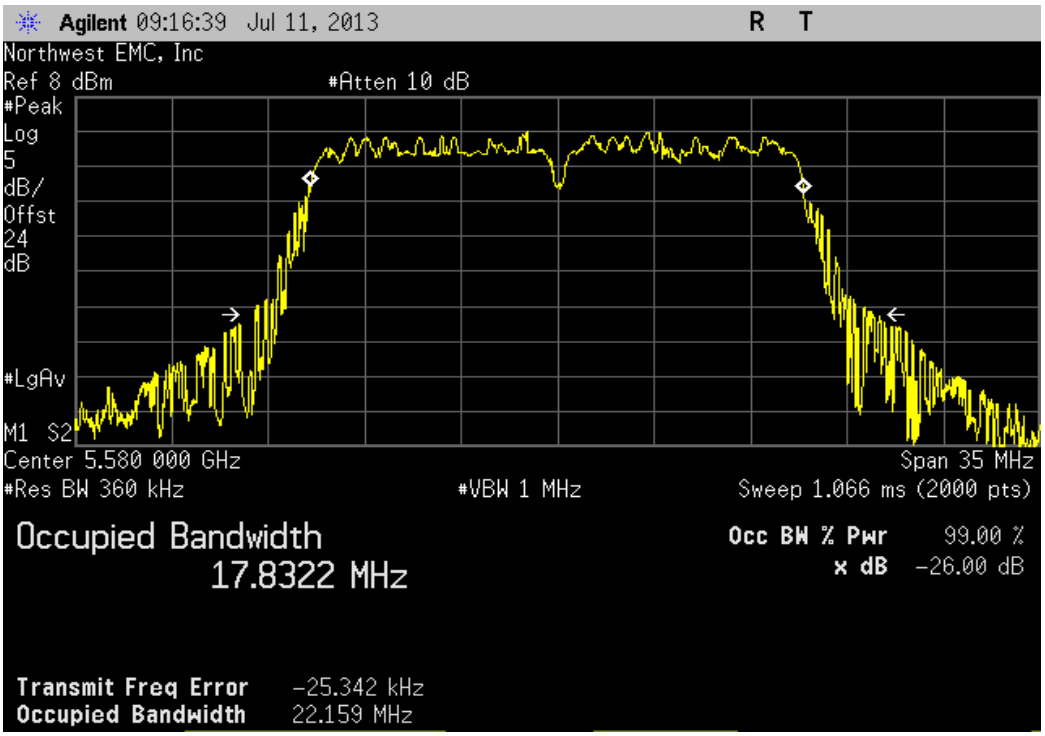
				Value	Limit	Result
				22.197 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

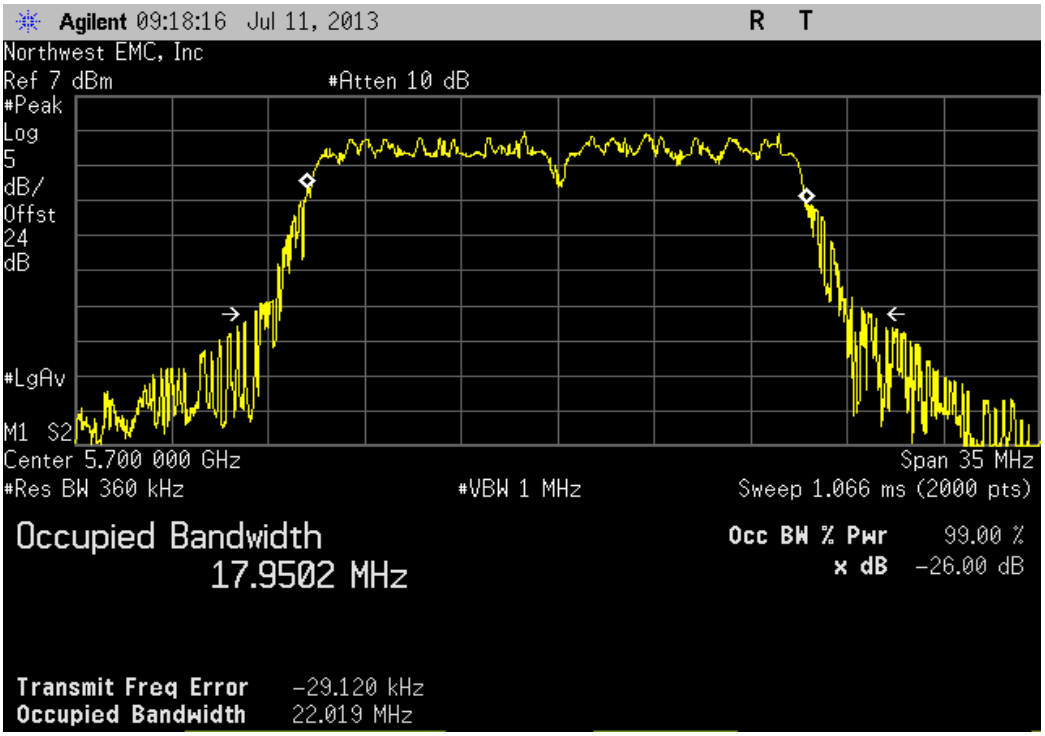
20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				22.159 MHz	> 500 kHz	Pass



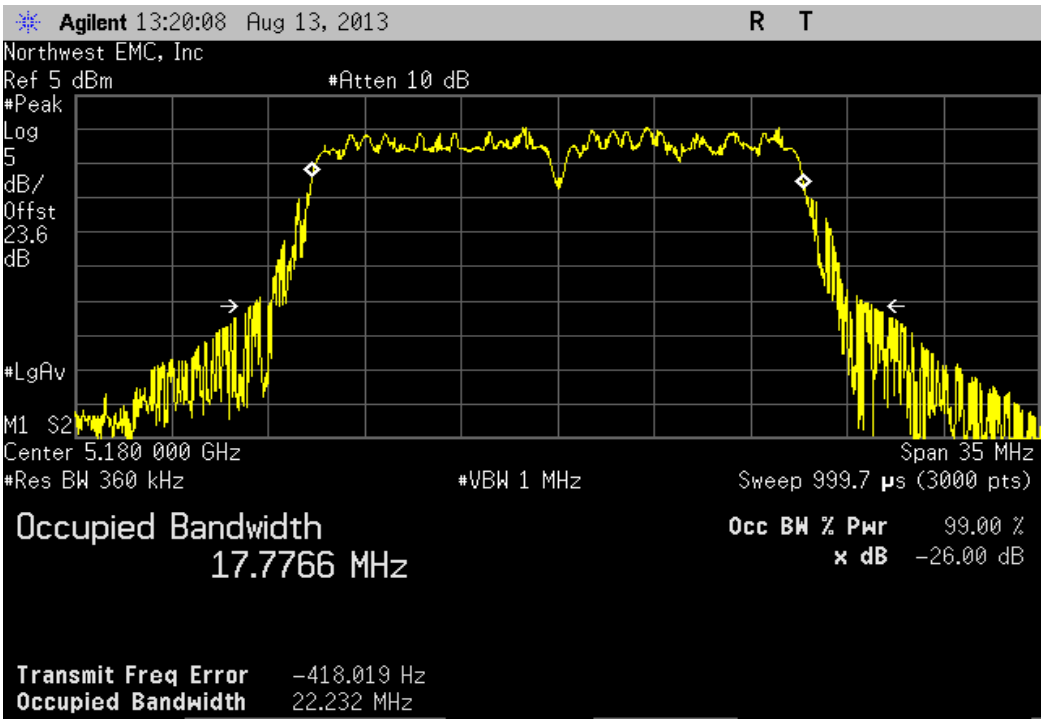
20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				22.019 MHz	> 500 kHz	Pass

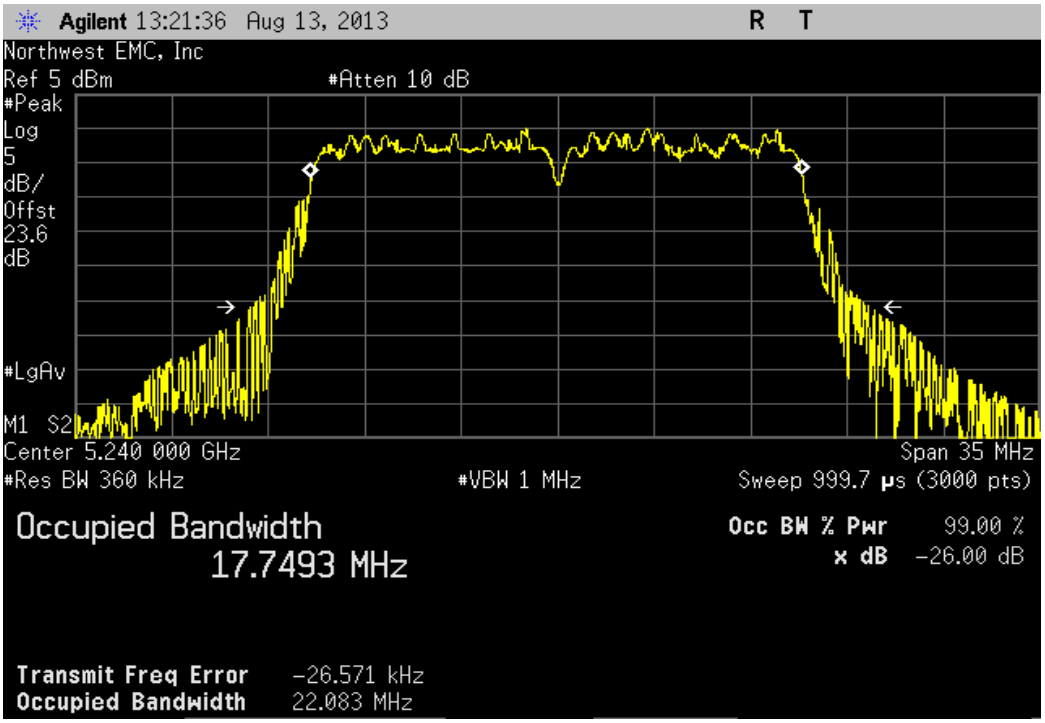


Emission Bandwidth - Antenna A

20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				22.232 MHz	> 500 kHz	Pass



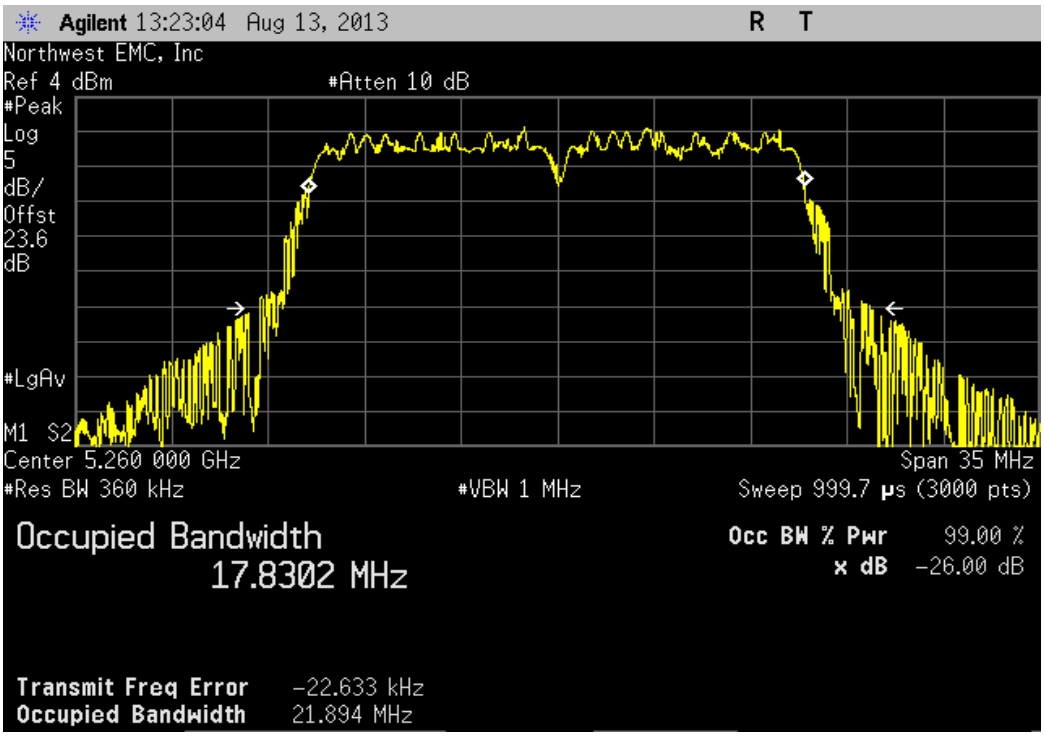
20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				22.083 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

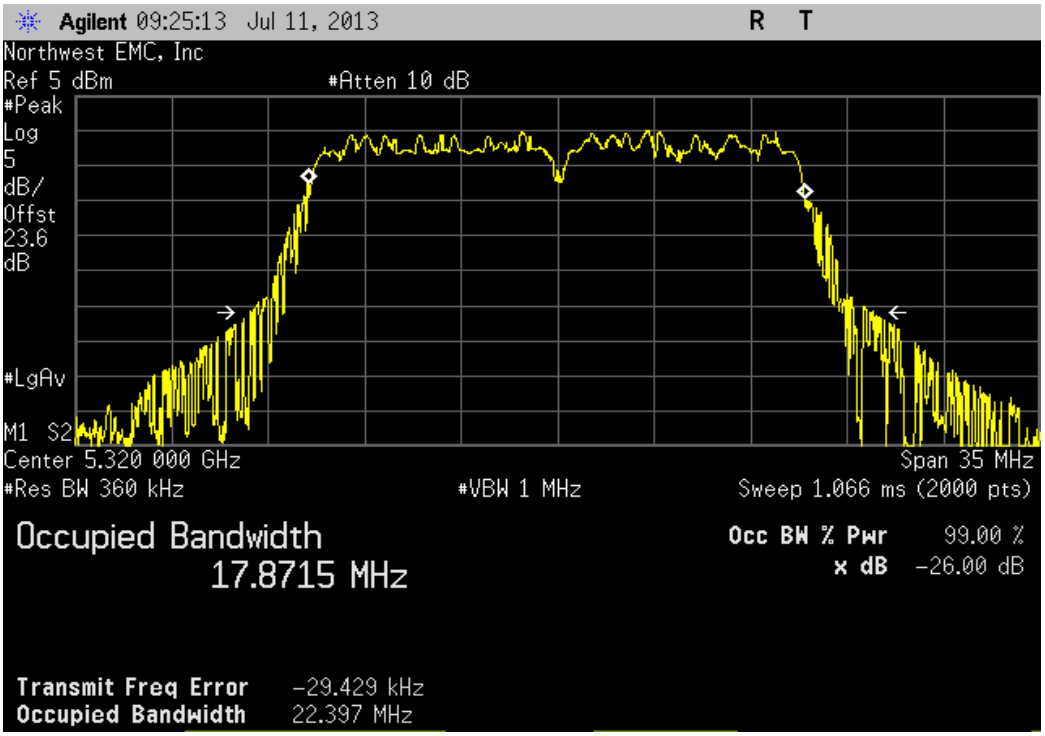
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.894 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

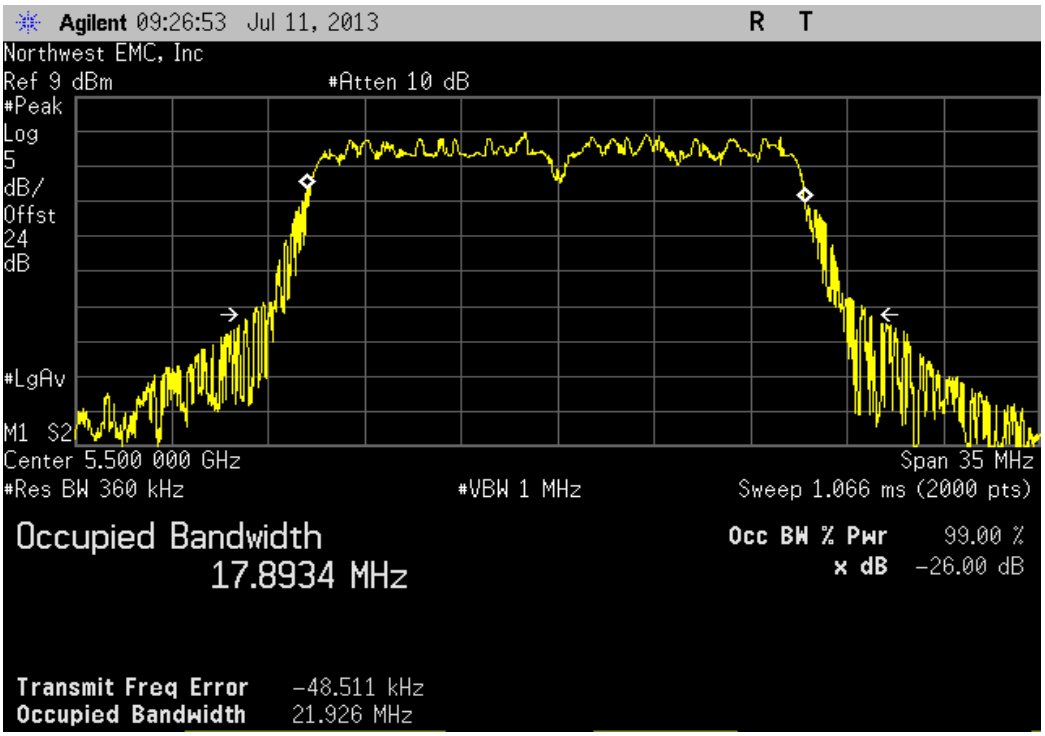
				Value	Limit	Result
				22.397 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

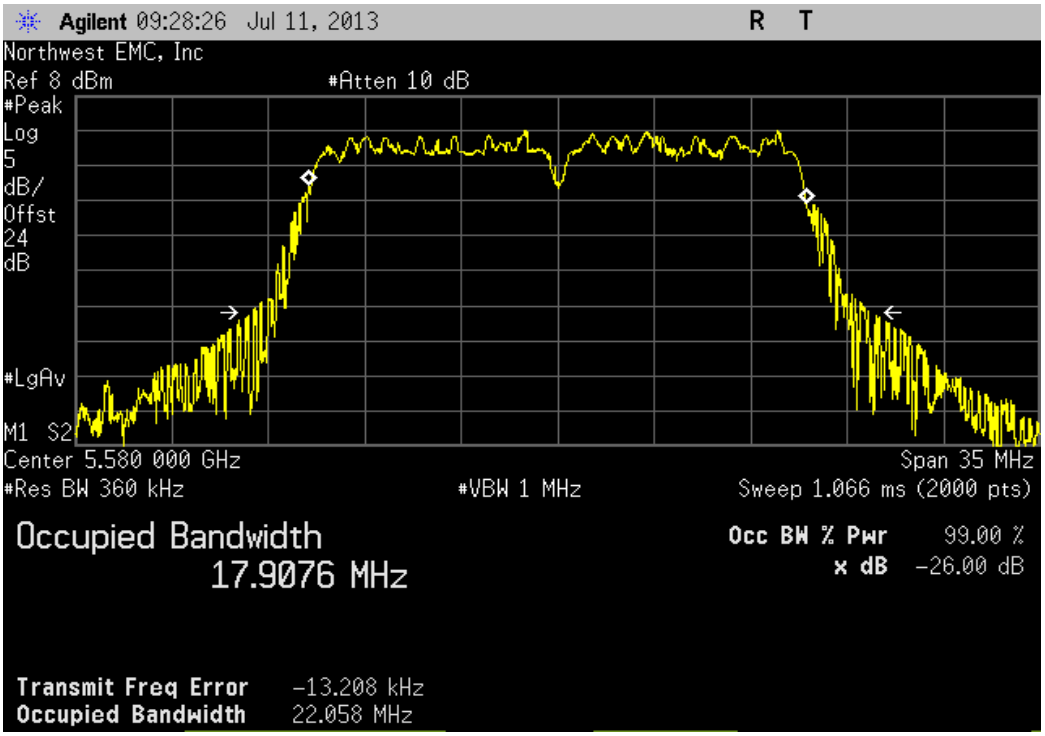
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.926 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz

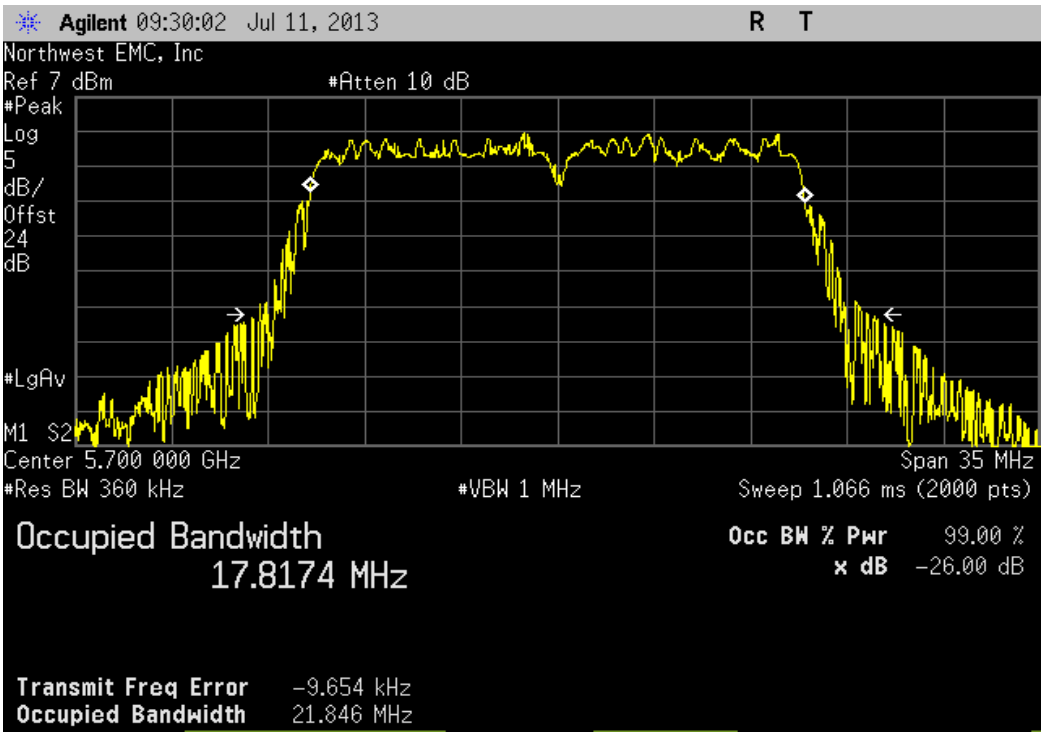
				Value	Limit	Result
				22.058 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

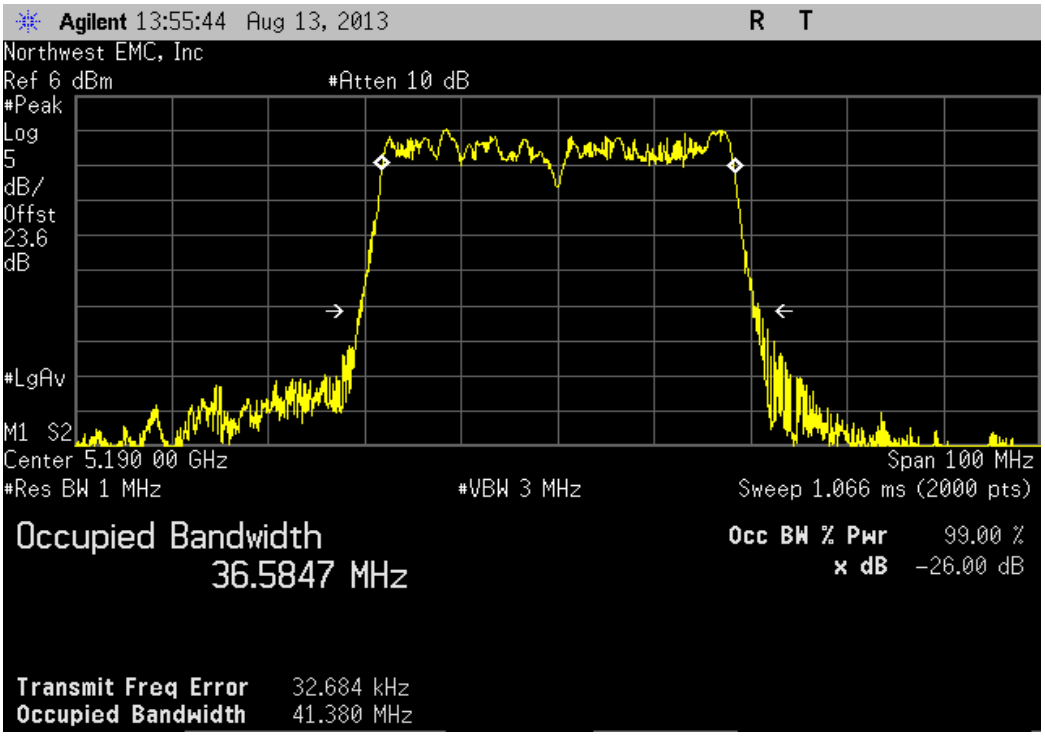
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.846 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz

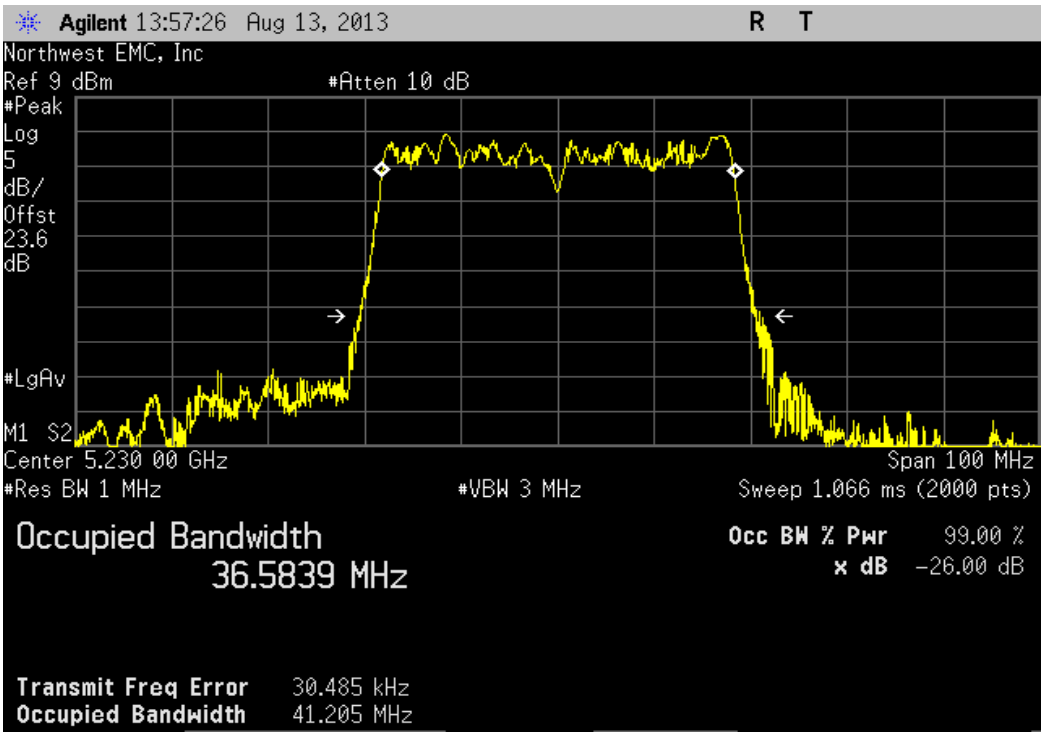
				Value	Limit	Result
				41.38 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

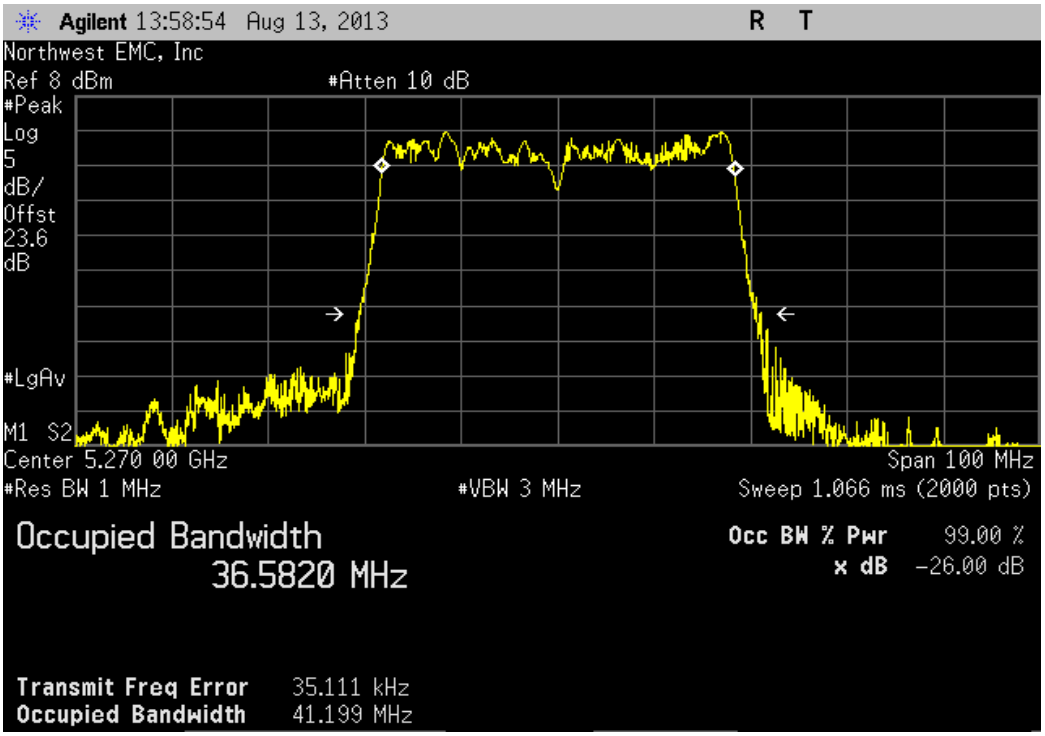
40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				41.205 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz

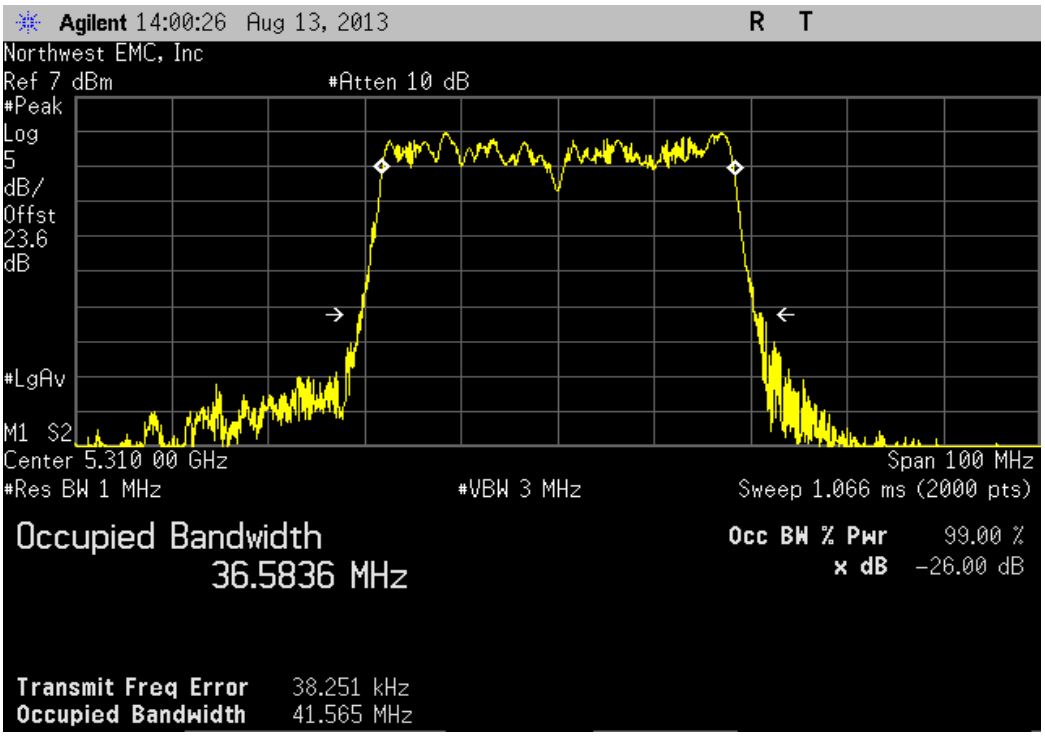
				Value	Limit	Result
				41.199 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

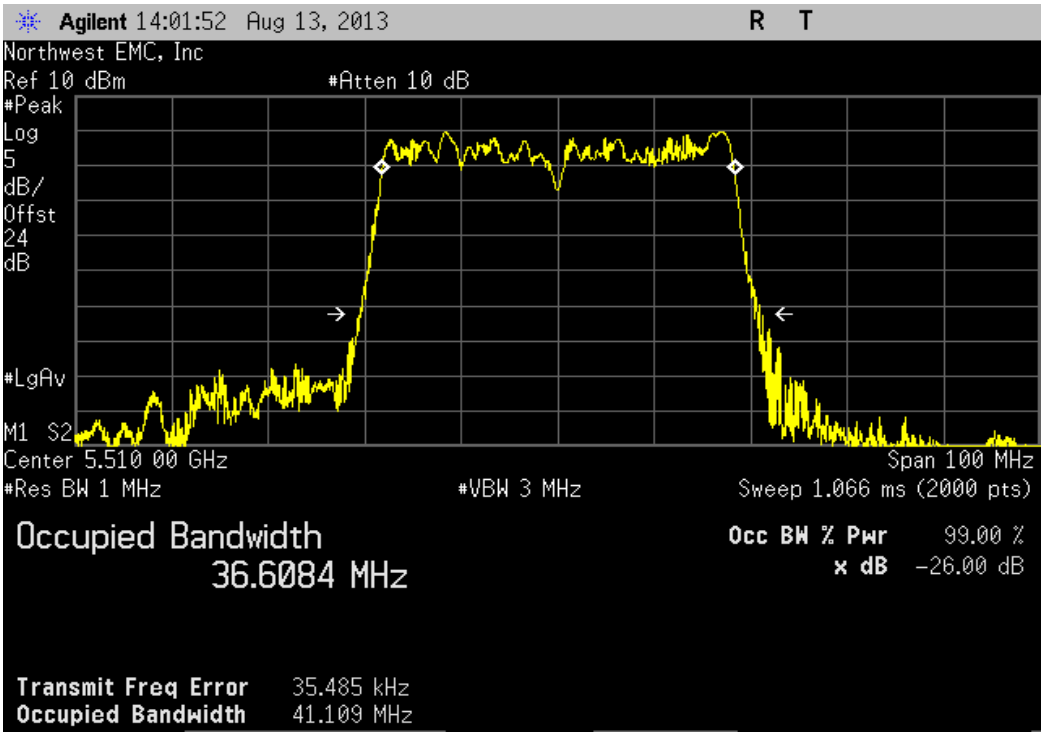
40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				41.565 MHz	> 500 kHz	Pass



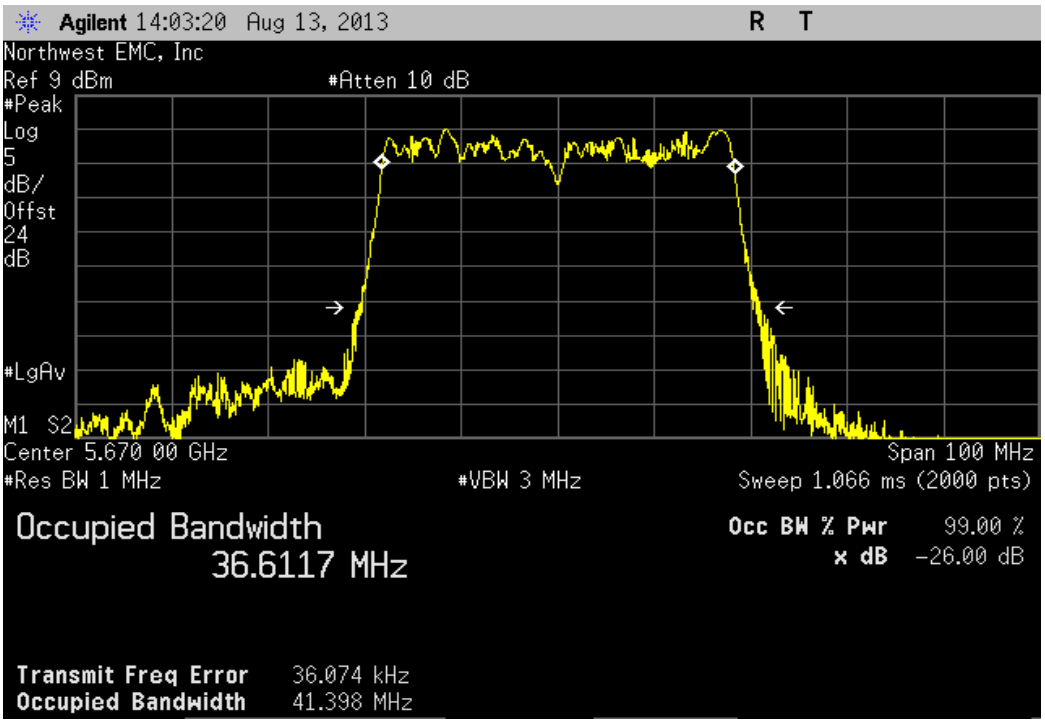
40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				41.109 MHz	> 500 kHz	Pass

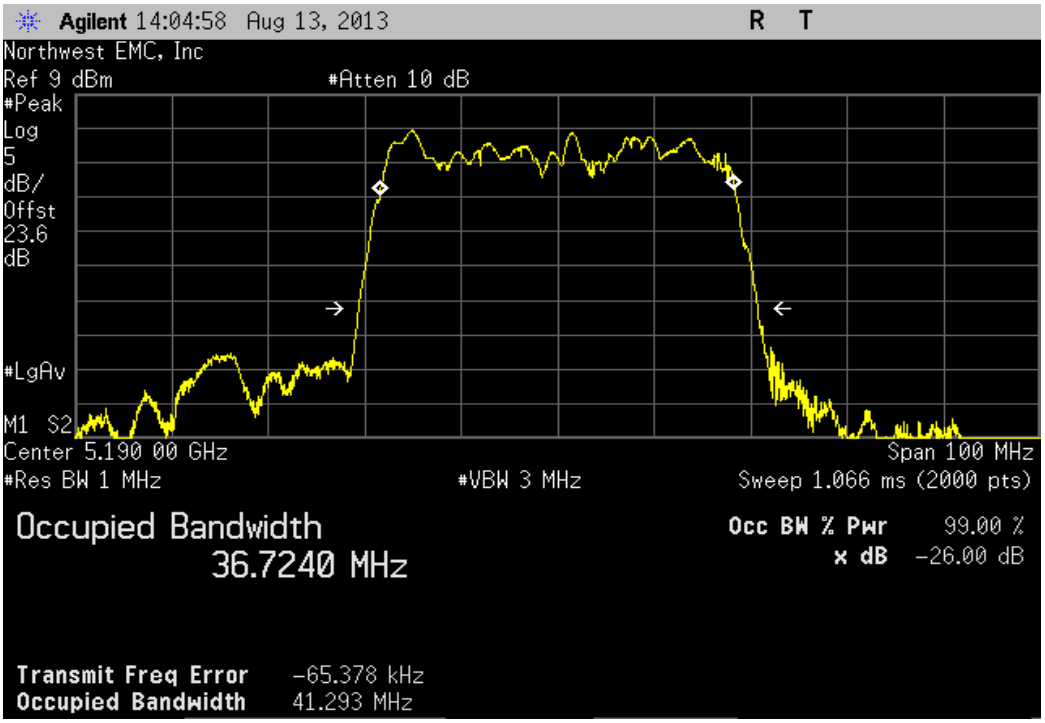


Emission Bandwidth - Antenna A

40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz						
				Value	Limit	Result
				41.398 MHz	> 500 kHz	Pass



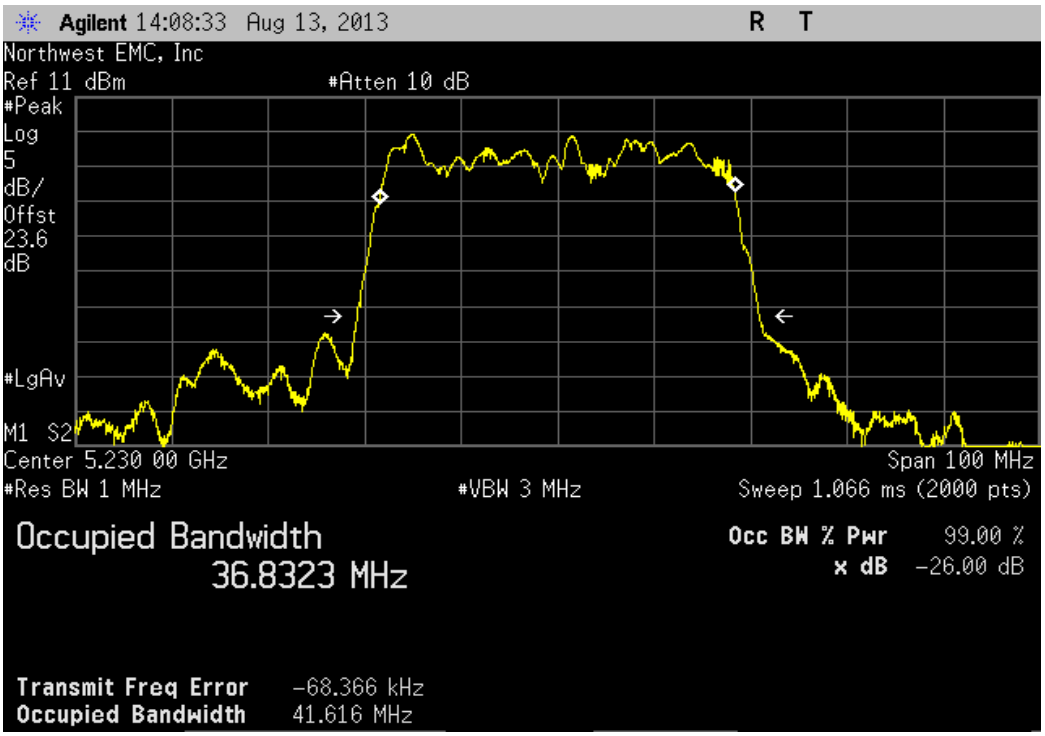
40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz						
				Value	Limit	Result
				41.293 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

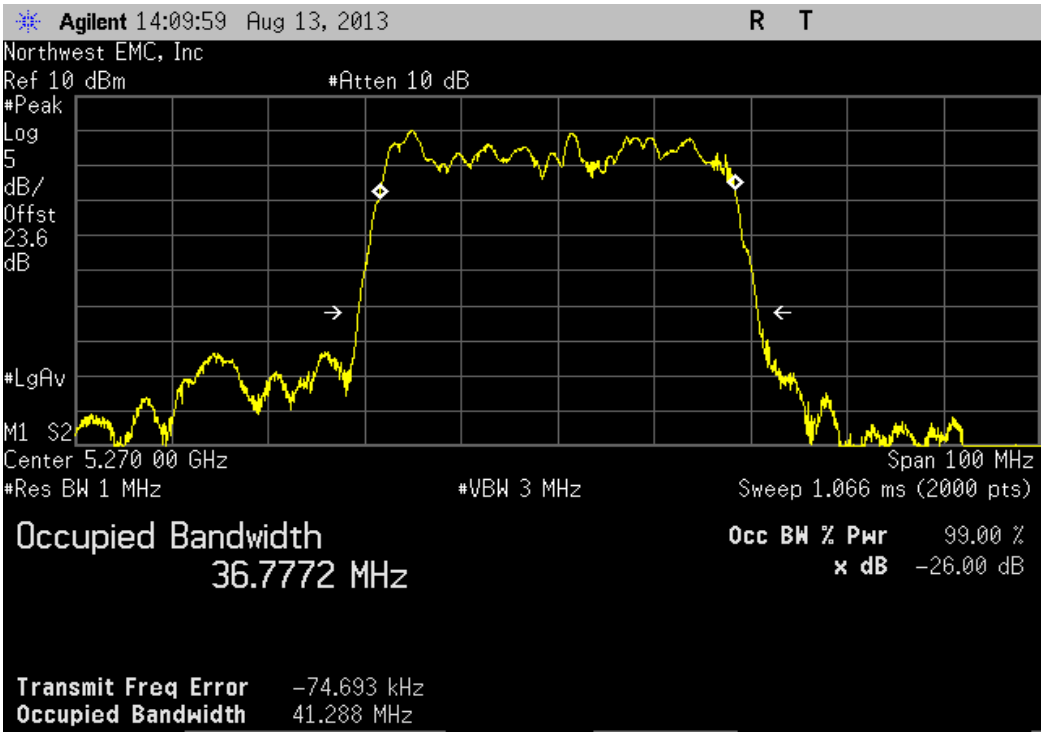
40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				41.616 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz

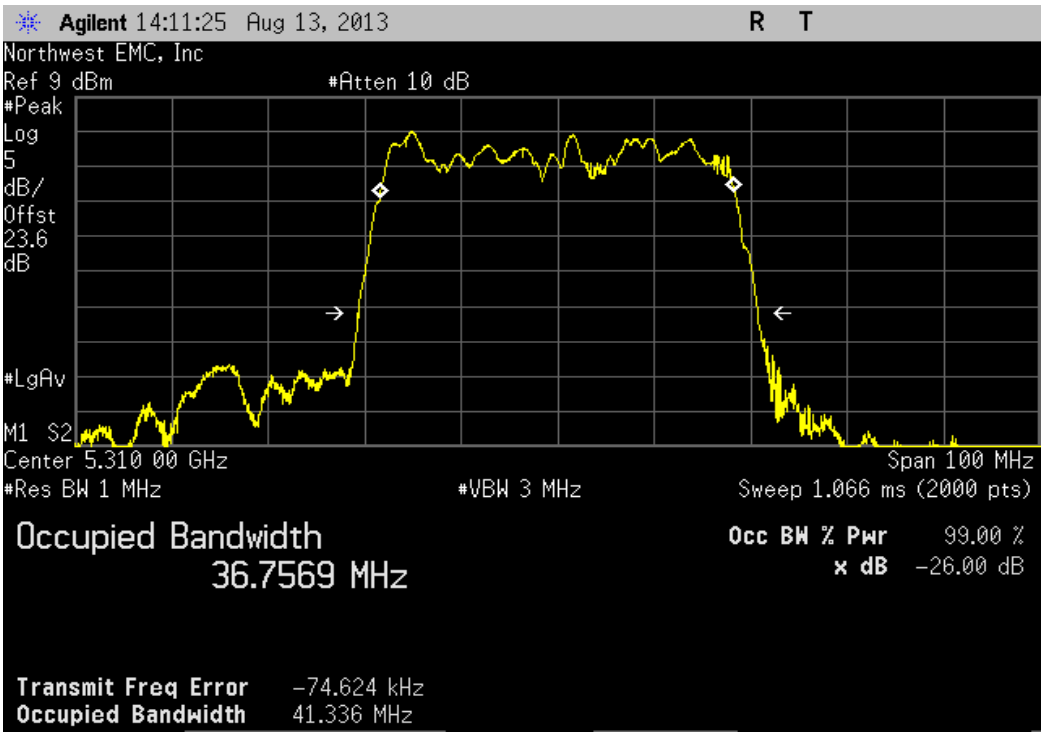
				Value	Limit	Result
				41.288 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

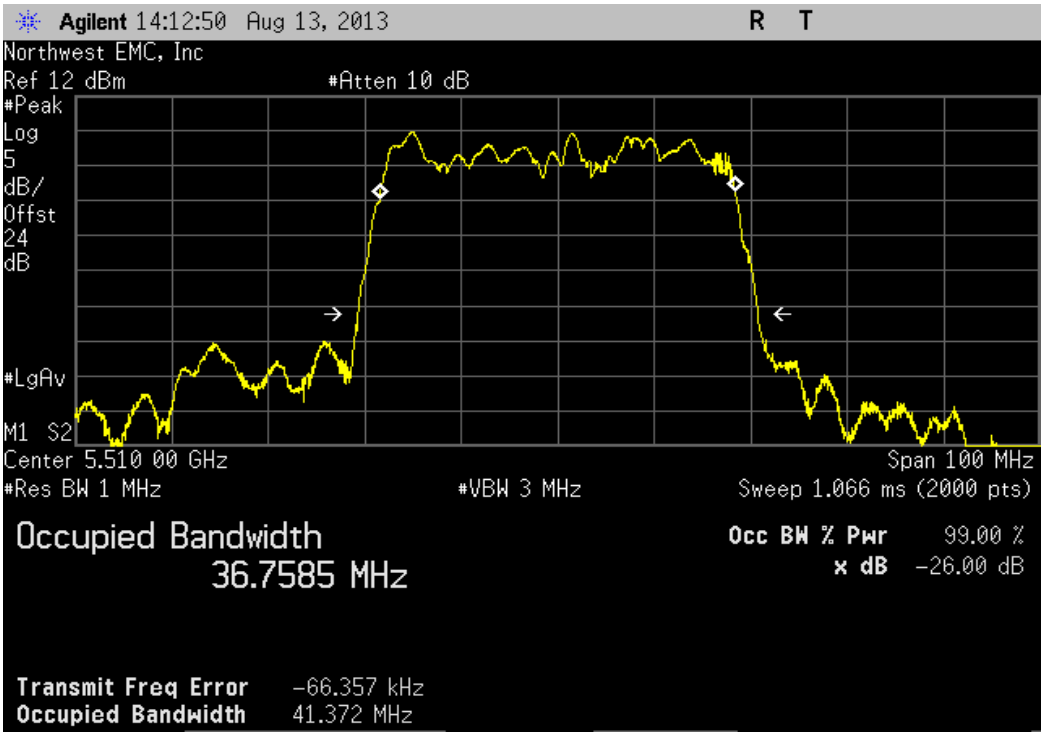
40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				41.336 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz

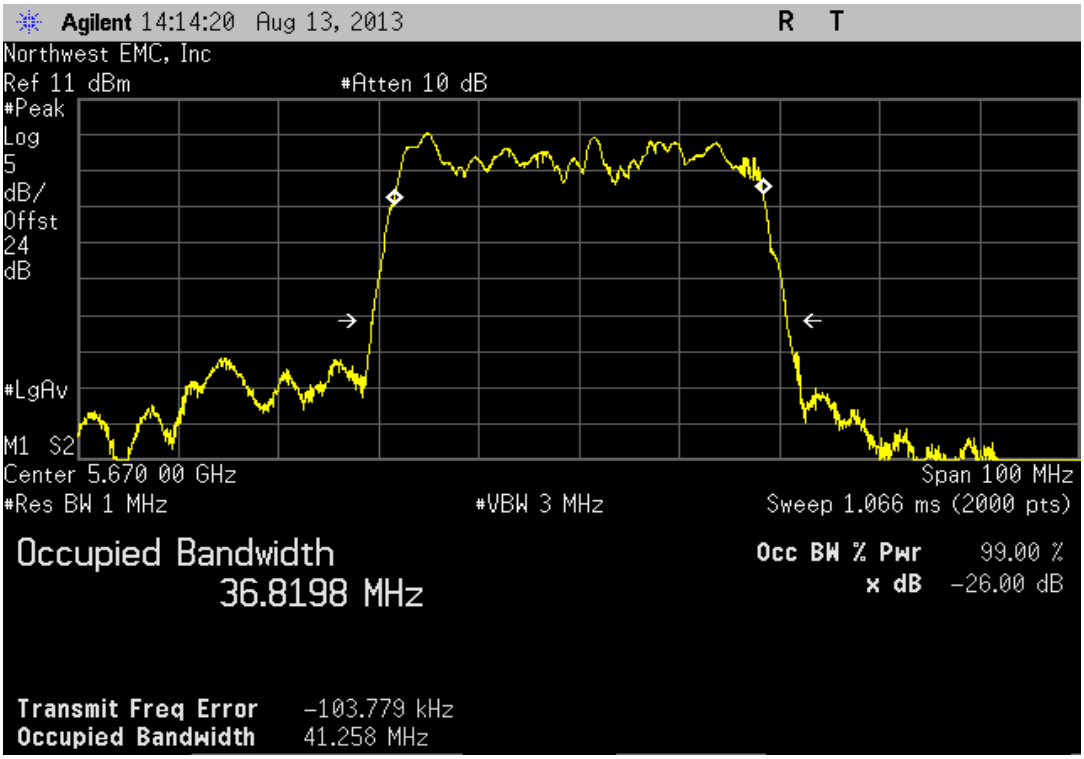
				Value	Limit	Result
				41.372 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna A

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				41.258 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

- RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).
- VBW= > RBW
- A peak detector was used
- Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output power testing.

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Emission Bandwidth - Antenna B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

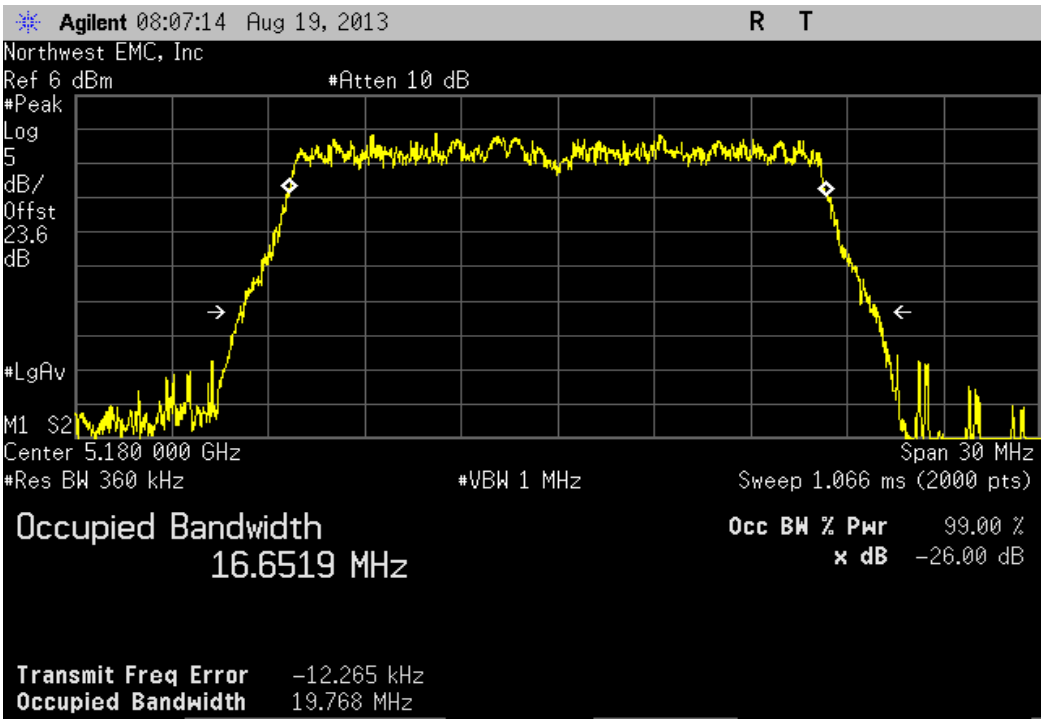
None

Configuration #	1	Signature

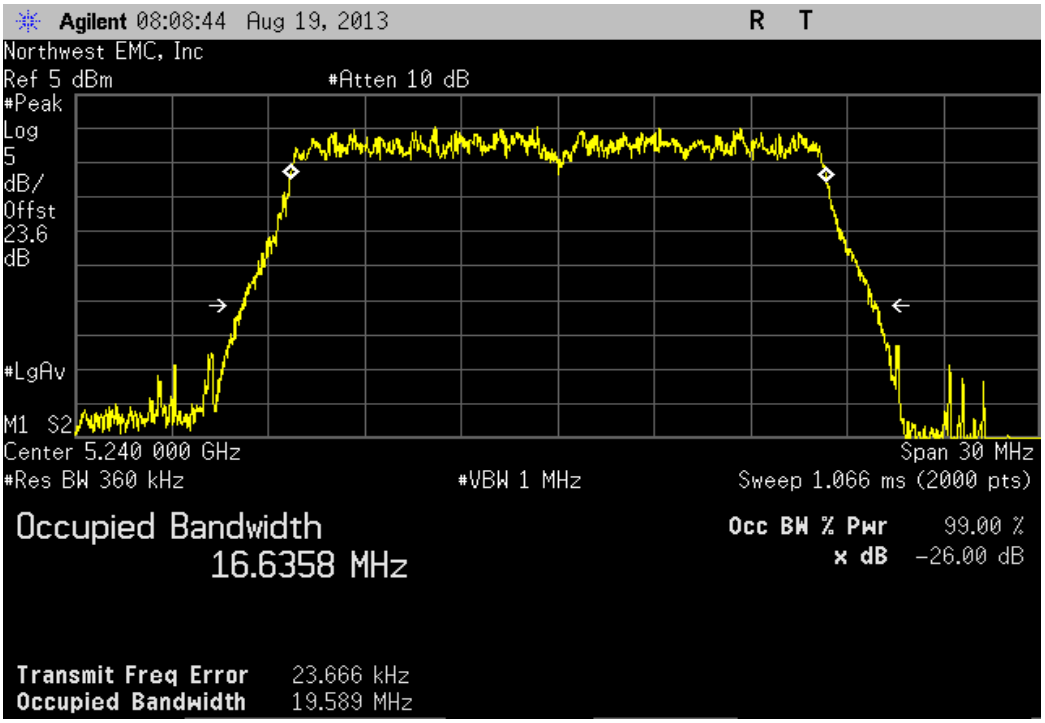
		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	19.768 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.589 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.698 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.663 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.651 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.799 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.692 MHz	> 500 kHz	Pass
	802.11(a) 36 Mbps			
	Ch 36, Low Channel 5180 MHz	19.712 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.754 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.821 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.754 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.781 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.789 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.724 MHz	> 500 kHz	Pass
	802.11(a) 54 Mbps			
	Ch 36, Low Channel 5180 MHz	19.731 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	19.738 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	19.701 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	19.814 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	19.873 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	19.684 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	19.87 MHz	> 500 kHz	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	21.317 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	21.489 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	21.676 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	21.167 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	21.361 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	21.714 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	21.68 MHz	> 500 kHz	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	21.313 MHz	> 500 kHz	Pass
	Ch 48, High Channel 5240 MHz	21.294 MHz	> 500 kHz	Pass
	Ch 52, Low Channel 5260 MHz	21.502 MHz	> 500 kHz	Pass
	Ch 64, High Channel 5320 MHz	21.454 MHz	> 500 kHz	Pass
	Ch 100, Low Channel 5500 MHz	21.761 MHz	> 500 kHz	Pass
	Ch 116, Mid Channel 5580 MHz	21.388 MHz	> 500 kHz	Pass
	Ch 140, High Channel 5700 MHz	21.266 MHz	> 500 kHz	Pass
40 MHz				
	802.11(n) MCS0			
	Ch 36/40, Low Channel 5190 MHz	43.38 MHz	> 500 kHz	Pass
	Ch 44/48, High Channel 5230 MHz	42.412 MHz	> 500 kHz	Pass
	Ch 52/56, Low Channel 5270 MHz	42.379 MHz	> 500 kHz	Pass
	Ch 60/64, High Channel 5310 MHz	42.484 MHz	> 500 kHz	Pass
	Ch 100/104, Low Channel 5510 MHz	42.509 MHz	> 500 kHz	Pass
	Ch 132/136, High Channel 5670 MHz	43.276 MHz	> 500 kHz	Pass
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	44.616 MHz	> 500 kHz	Pass
	Ch 44/48, High Channel 5230 MHz	43.954 MHz	> 500 kHz	Pass
	Ch 52/56, Low Channel 5270 MHz	44.094 MHz	> 500 kHz	Pass
	Ch 60/64, High Channel 5310 MHz	44.419 MHz	> 500 kHz	Pass
	Ch 100/104, Low Channel 5510 MHz	43.958 MHz	> 500 kHz	Pass
	Ch 132/136, High Channel 5670 MHz	43.676 MHz	> 500 kHz	Pass

Emission Bandwidth - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				19.768 MHz	> 500 kHz	Pass



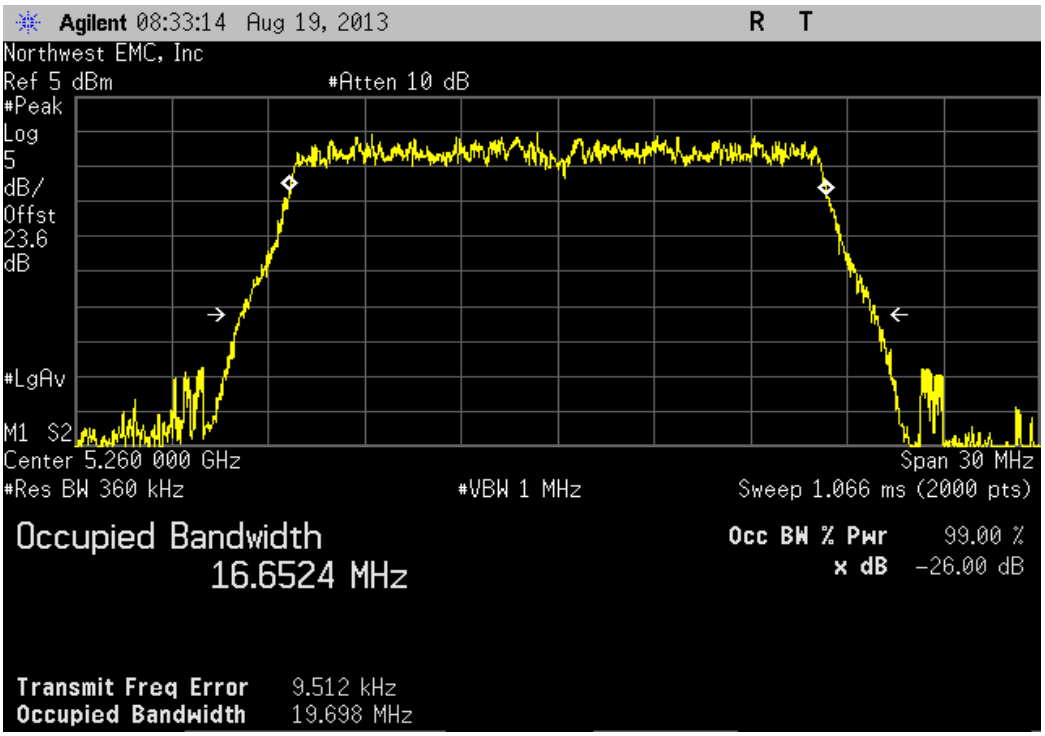
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				19.589 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

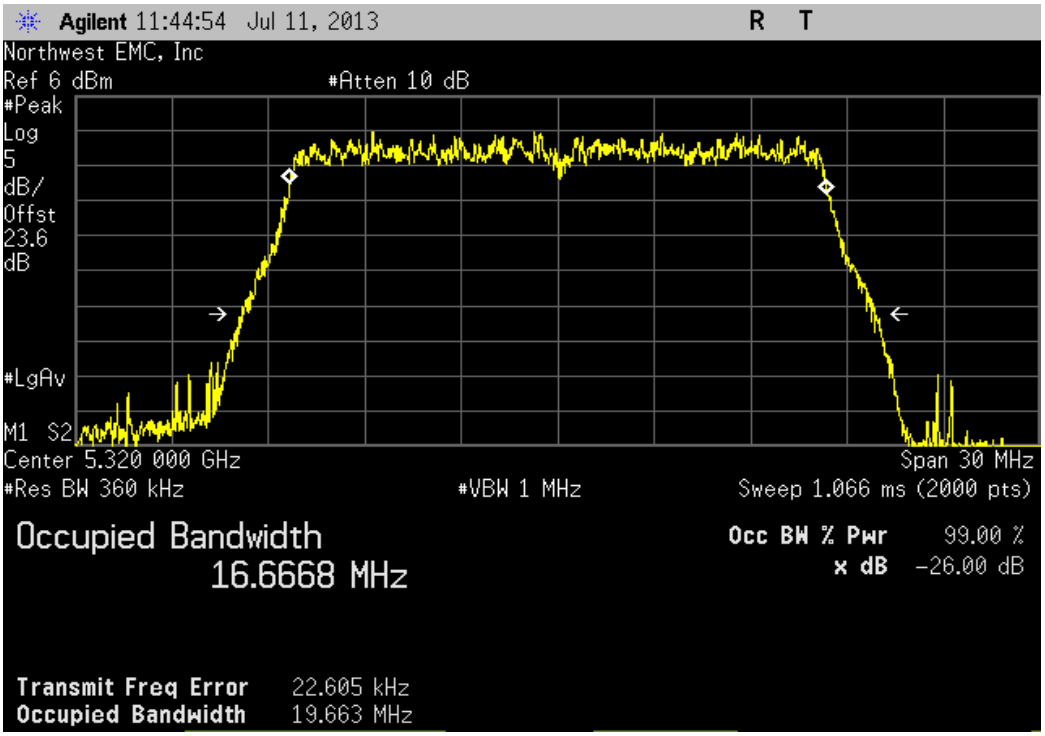
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.698 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz

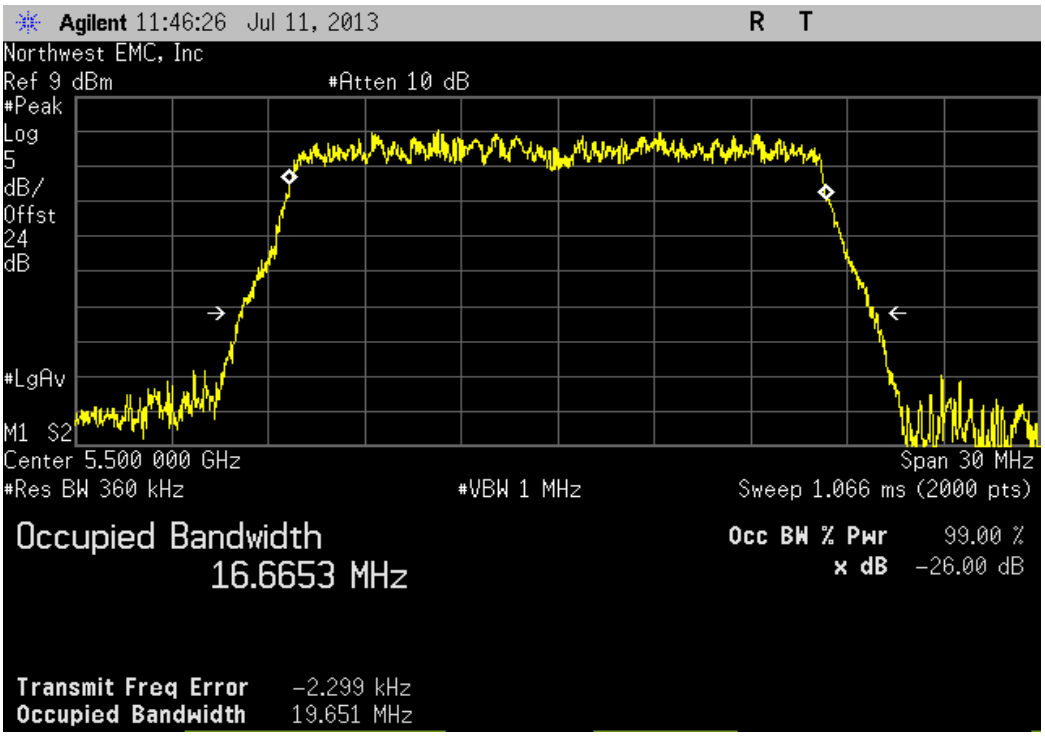
				Value	Limit	Result
				19.663 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

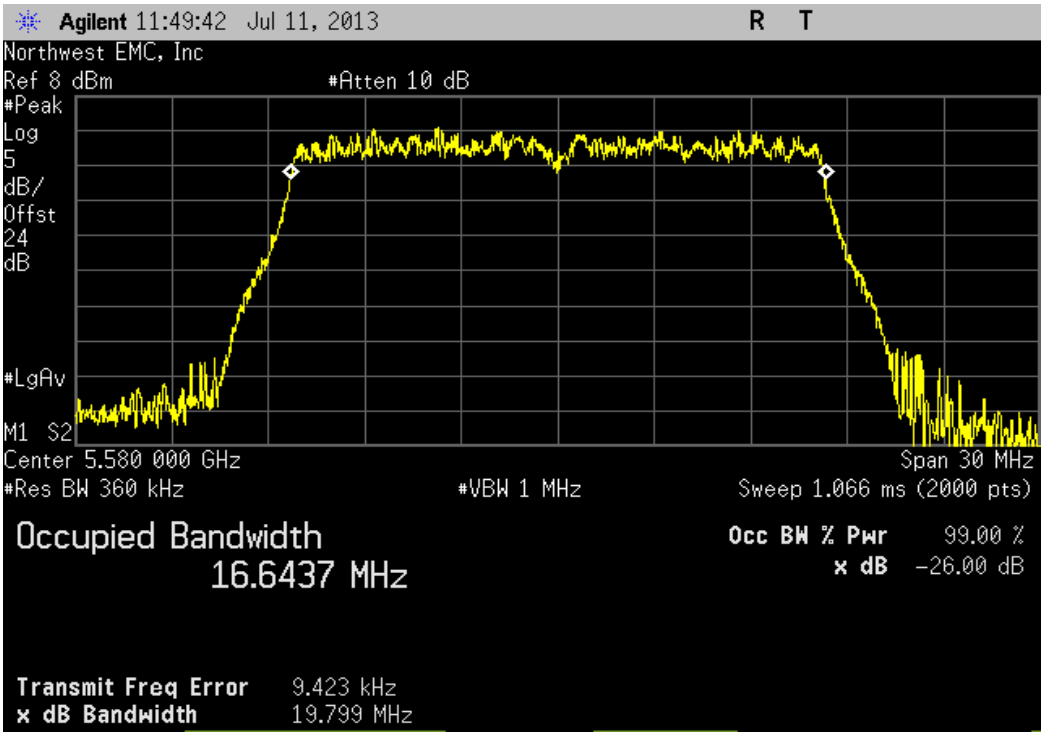
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				19.651 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

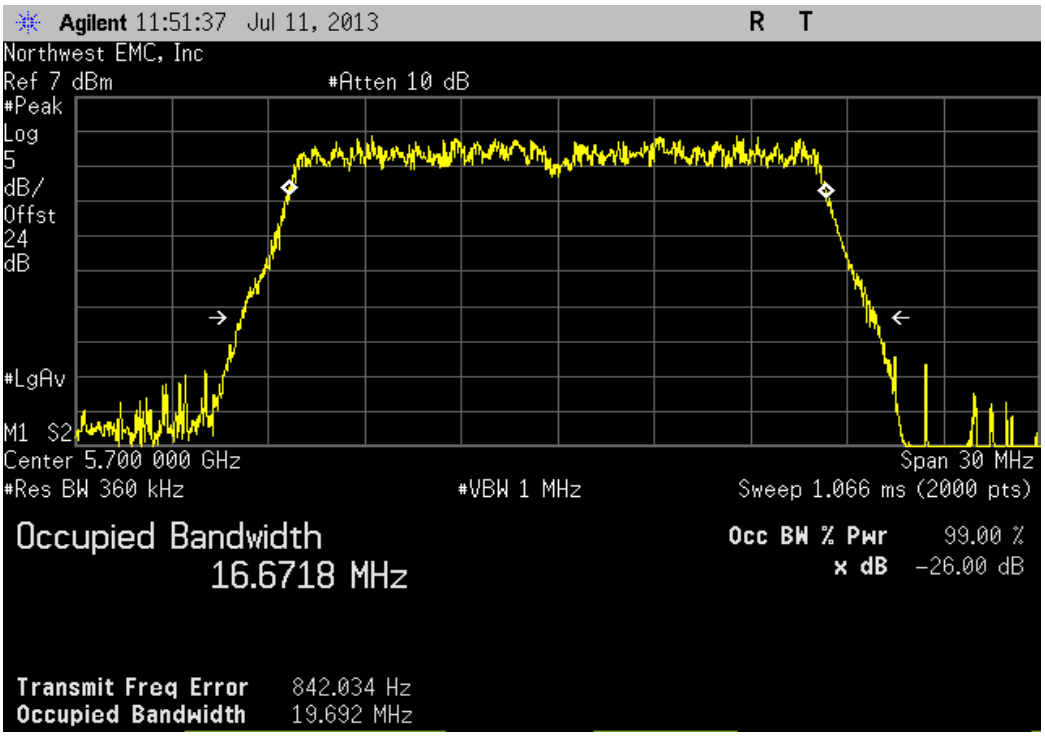
				Value	Limit	Result
				19.799 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

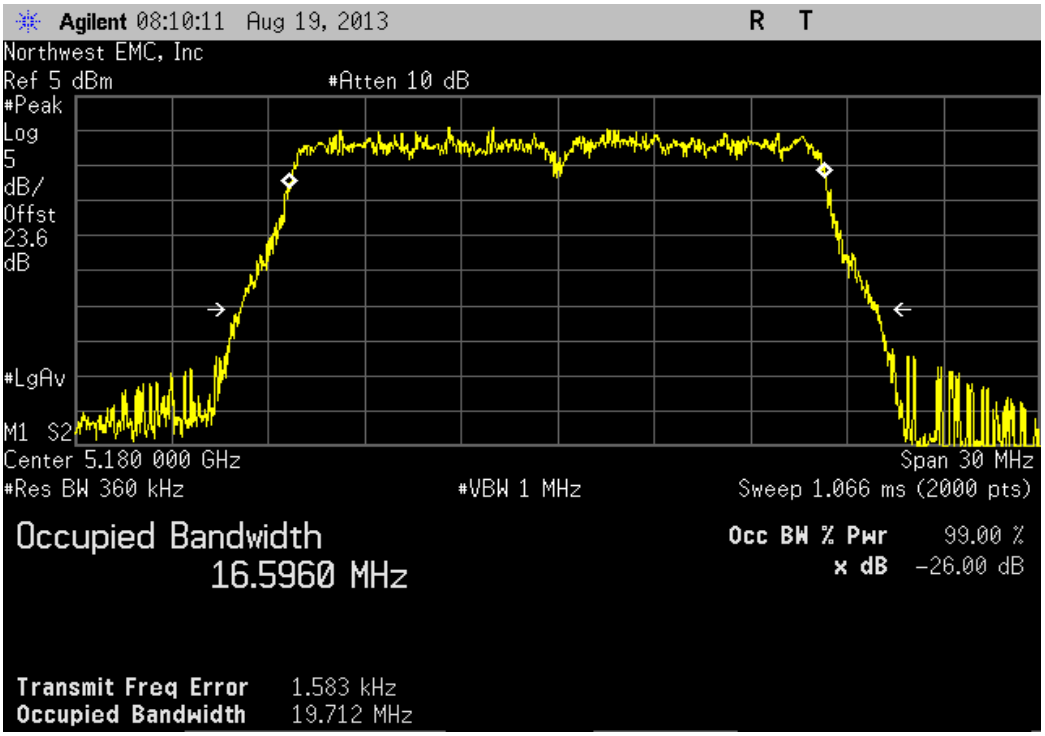
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				19.692 MHz	> 500 kHz	Pass



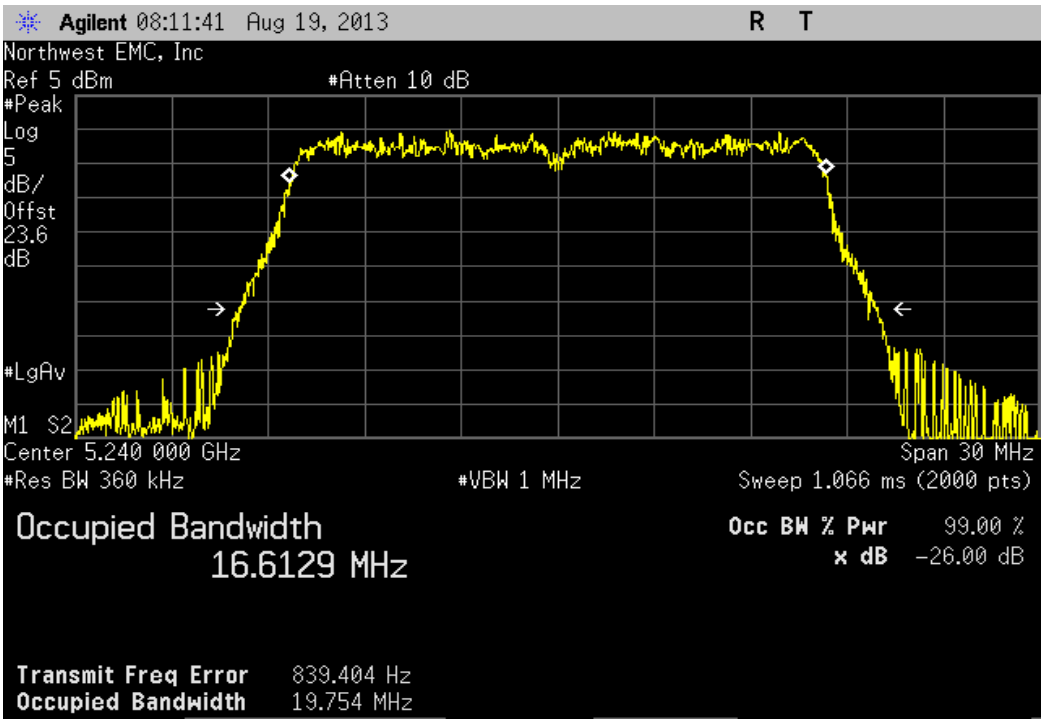
20 MHz, 802.11(a) 36 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				19.712 MHz	> 500 kHz	Pass

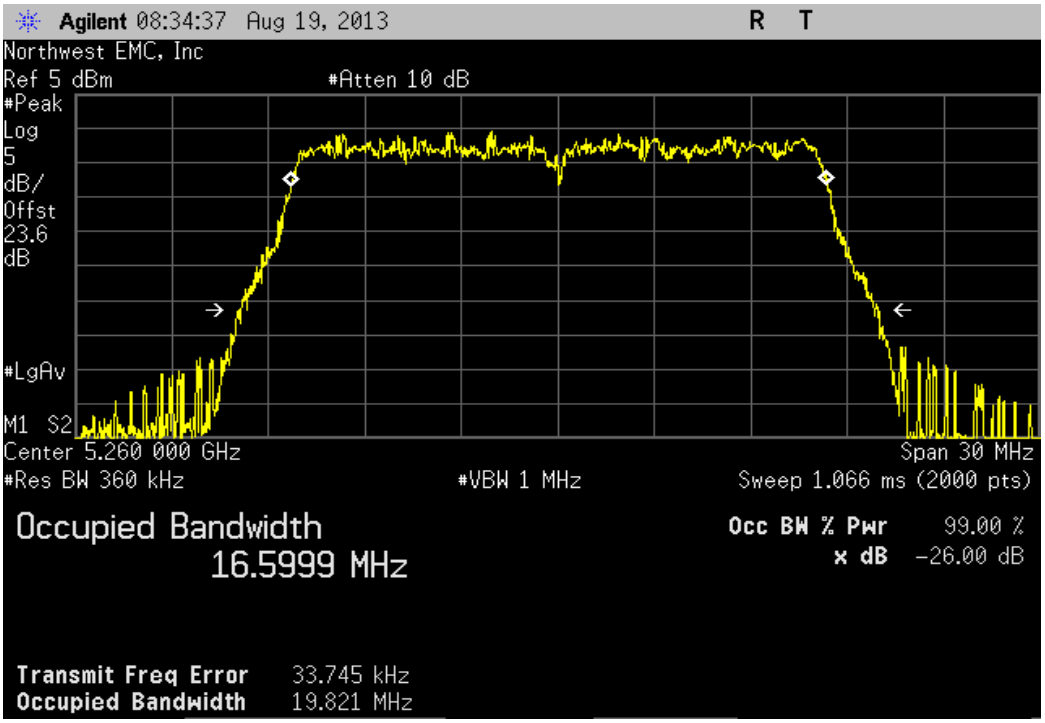


Emission Bandwidth - Antenna B

20 MHz, 802.11(a) 36 Mbps, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				19.754 MHz	> 500 kHz	Pass



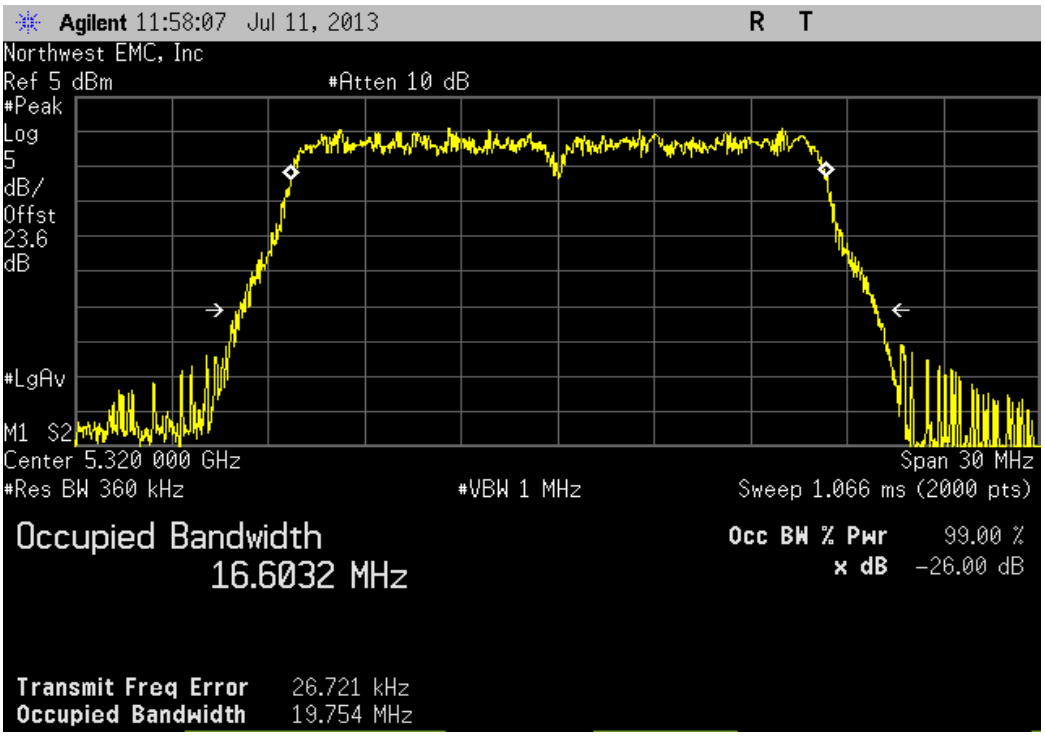
20 MHz, 802.11(a) 36 Mbps, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				19.821 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

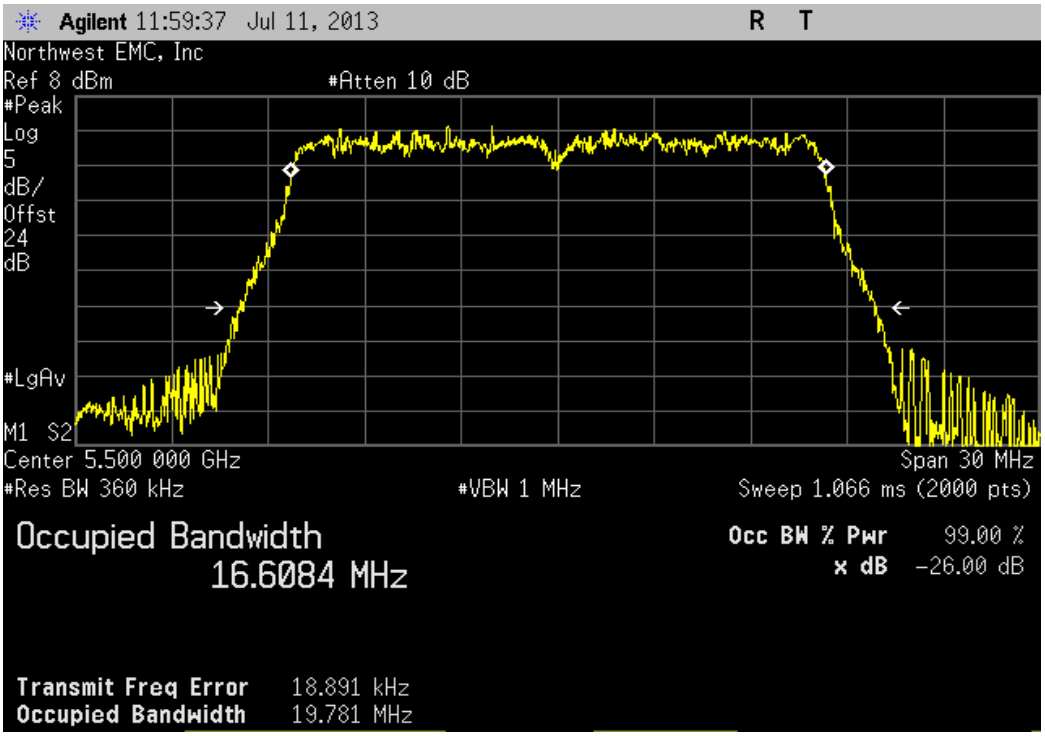
20 MHz, 802.11(a) 36 Mbps, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				19.754 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 100, Low Channel 5500 MHz

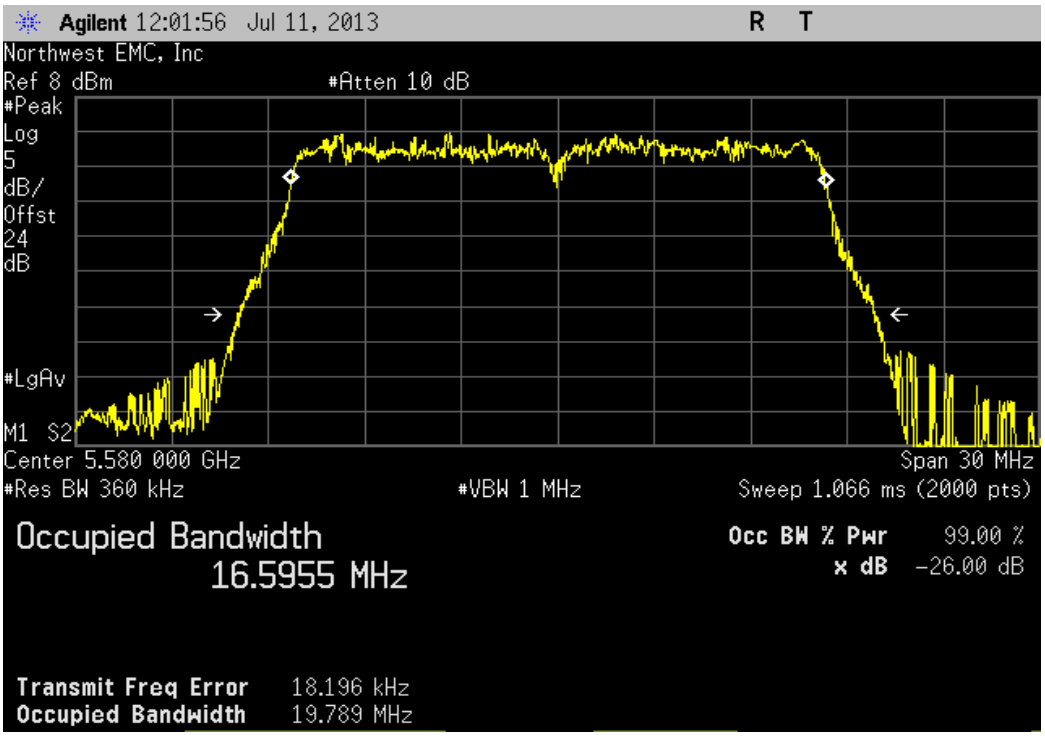
				Value	Limit	Result
				19.781 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

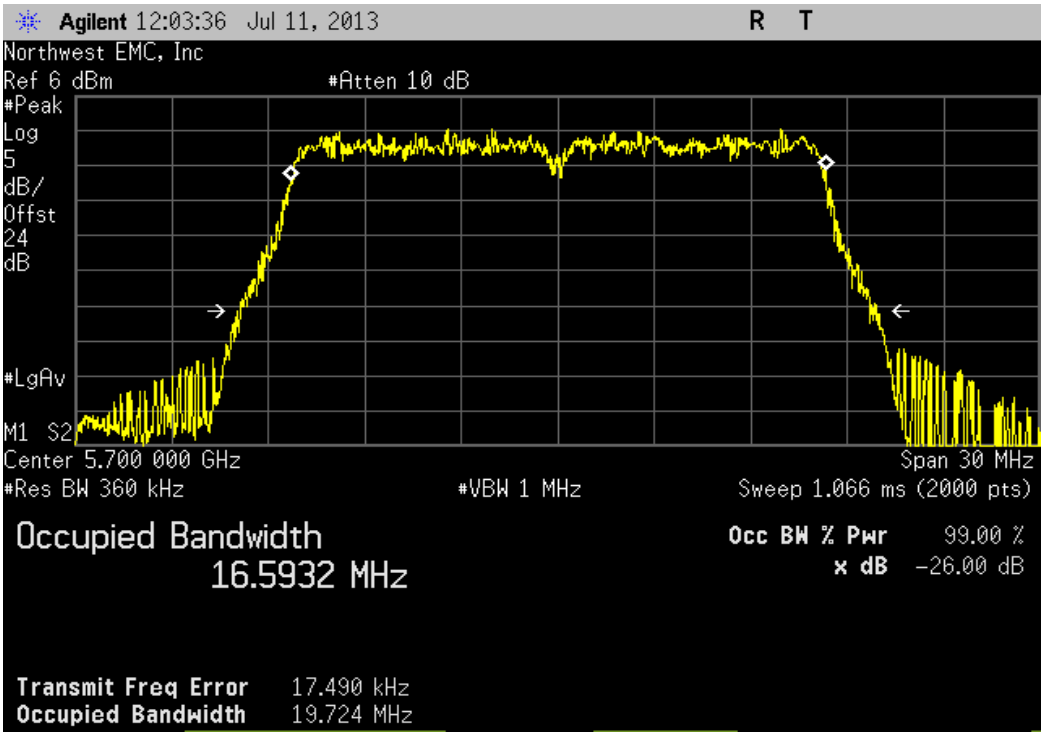
20 MHz, 802.11(a) 36 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.789 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 36 Mbps, Ch 140, High Channel 5700 MHz

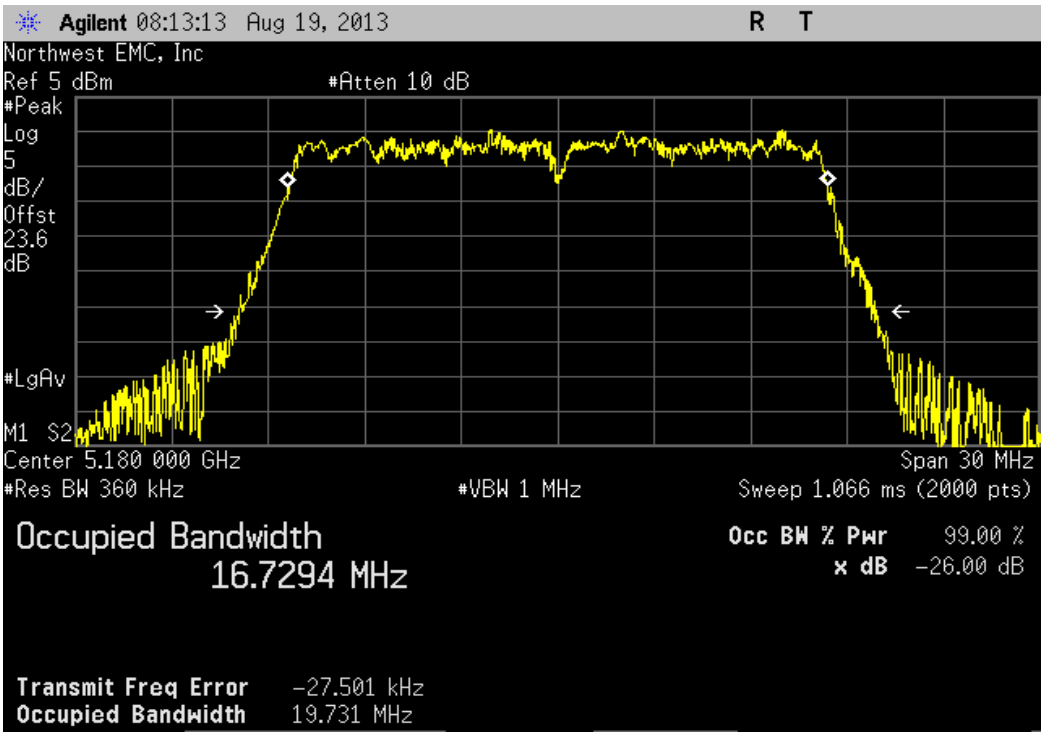
				Value	Limit	Result
				19.724 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

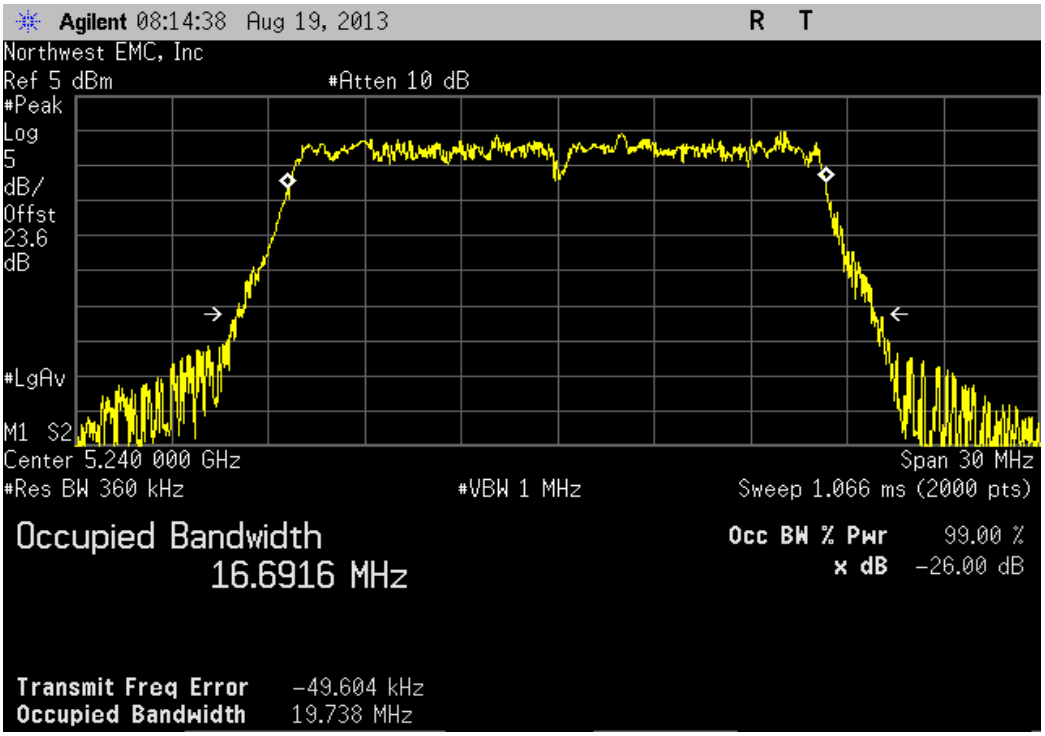
20 MHz, 802.11(a) 54 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				19.731 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 48, High Channel 5240 MHz

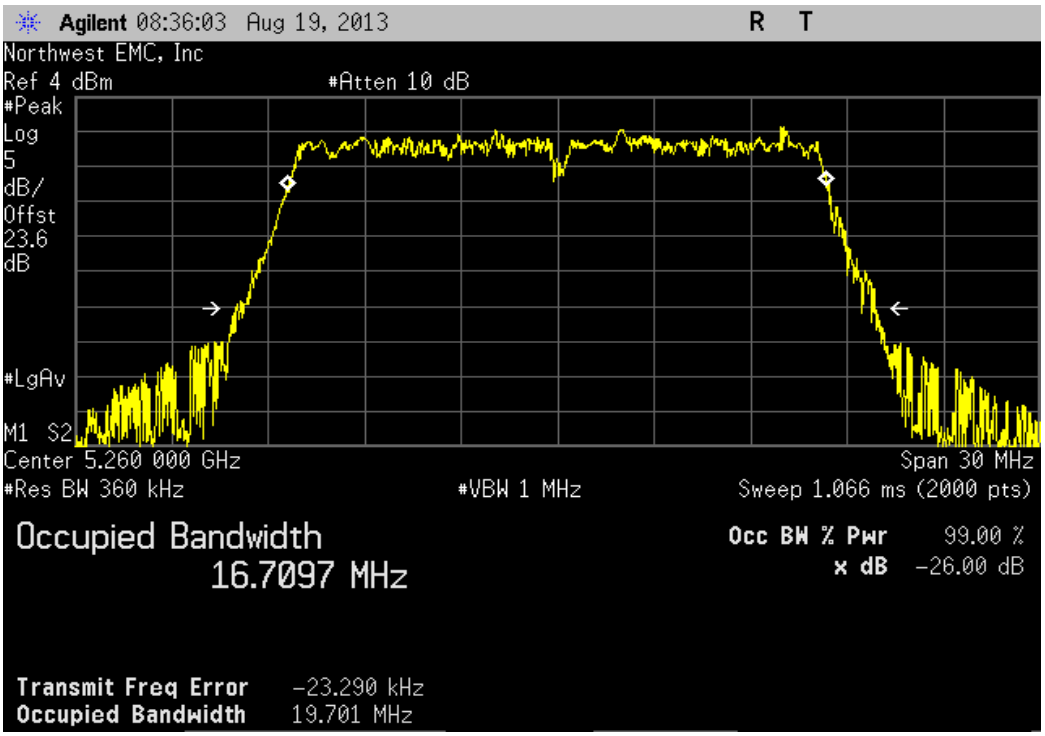
				Value	Limit	Result
				19.738 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

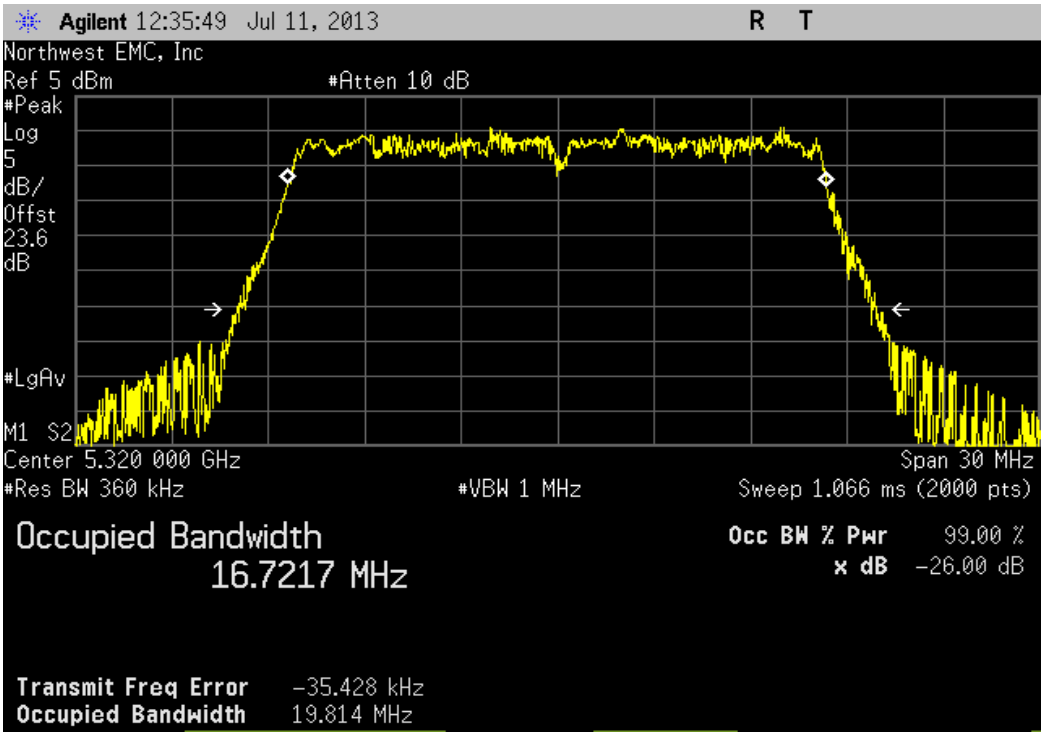
20 MHz, 802.11(a) 54 Mbps, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				19.701 MHz	> 500 kHz	Pass



20 MHz, 802.11(a) 54 Mbps, Ch 64, High Channel 5320 MHz

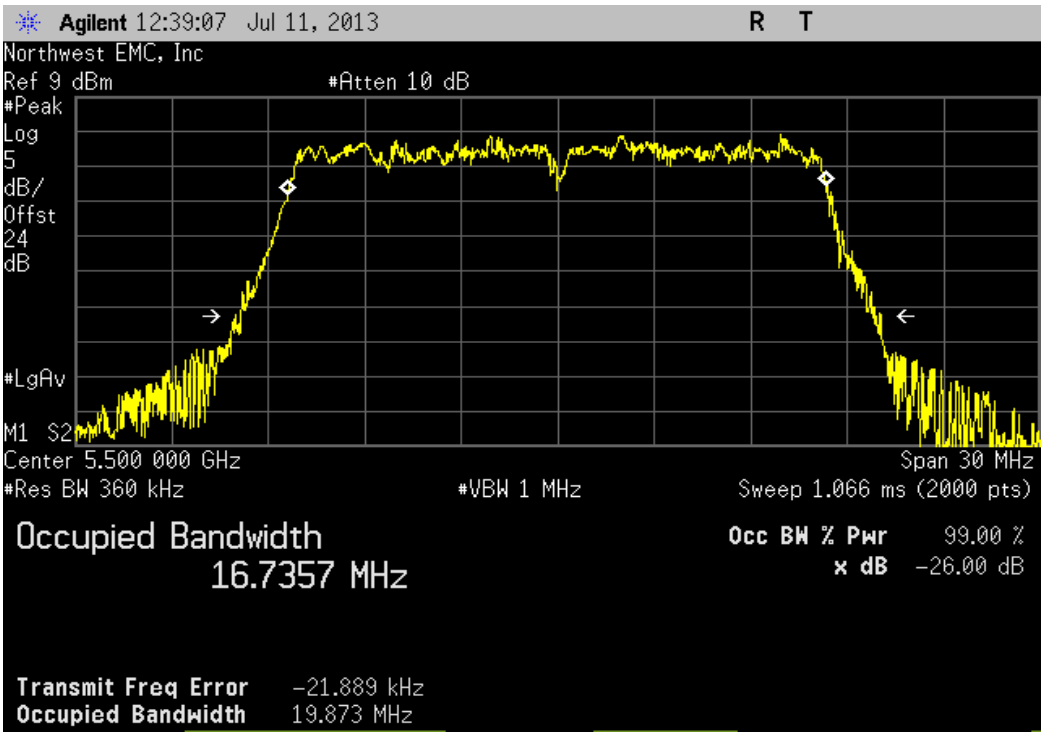
				Value	Limit	Result
				19.814 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

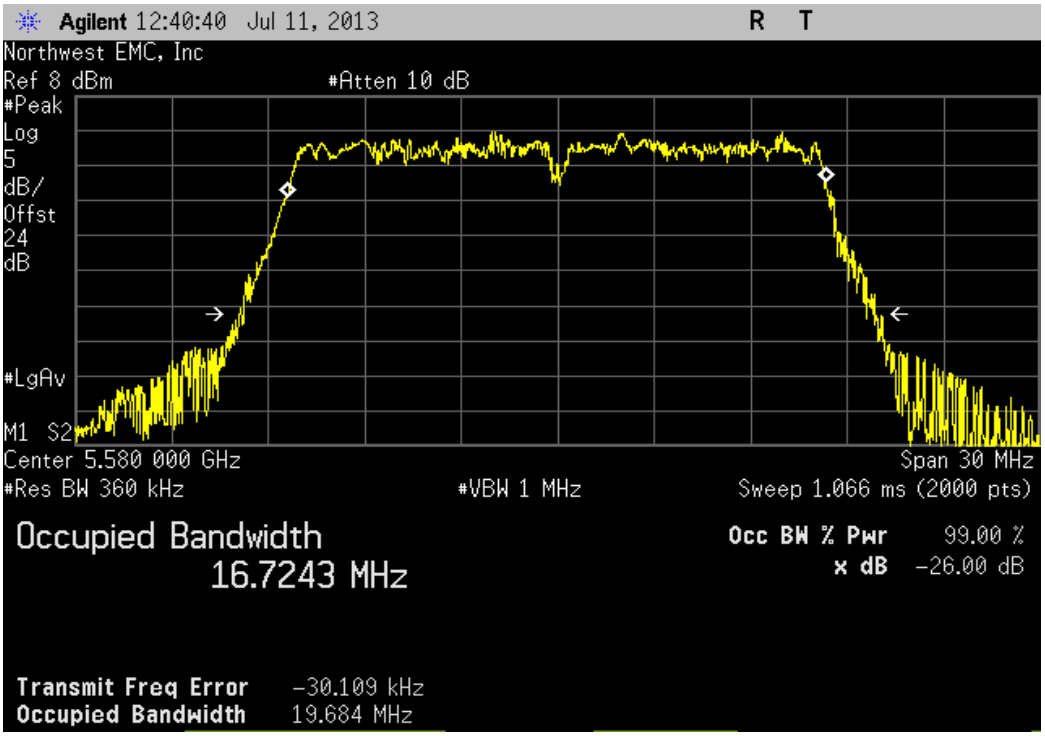
20 MHz, 802.11(a) 54 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				19.873 MHz	> 500 kHz	Pass



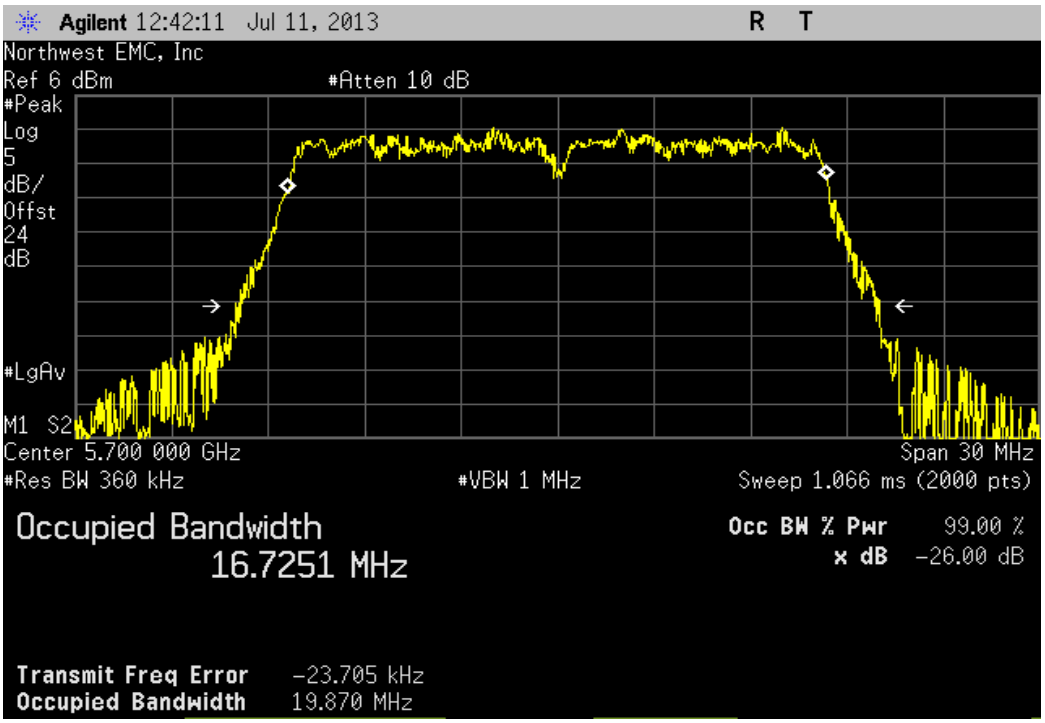
20 MHz, 802.11(a) 54 Mbps, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				19.684 MHz	> 500 kHz	Pass

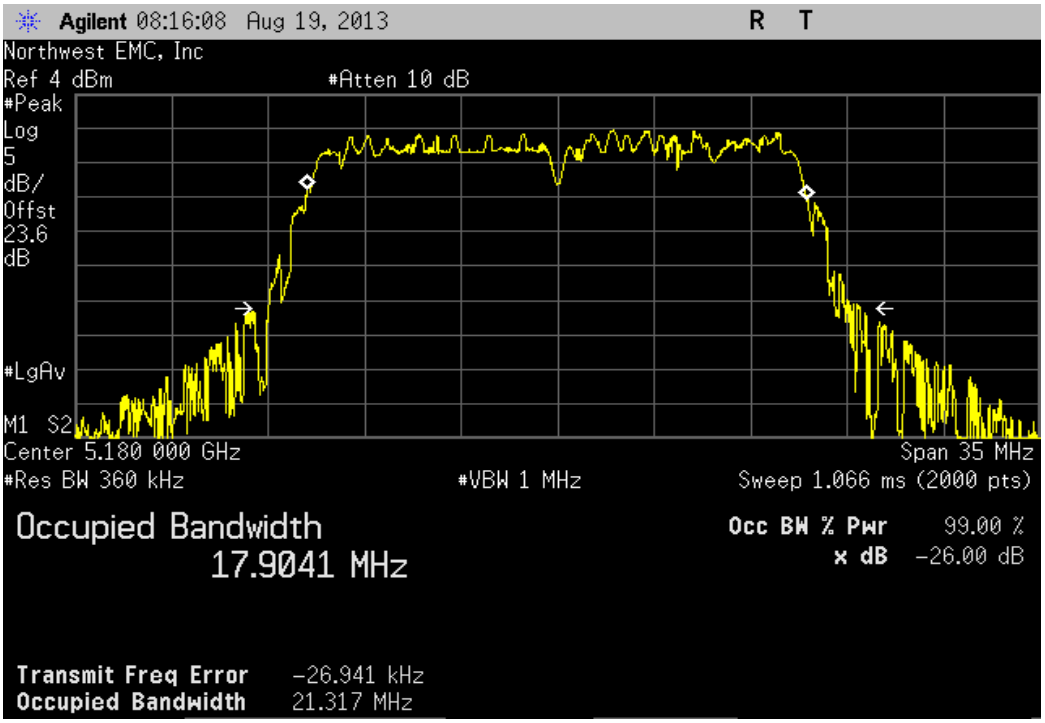


Emission Bandwidth - Antenna B

20 MHz, 802.11(a) 54 Mbps, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				19.87 MHz	> 500 kHz	Pass



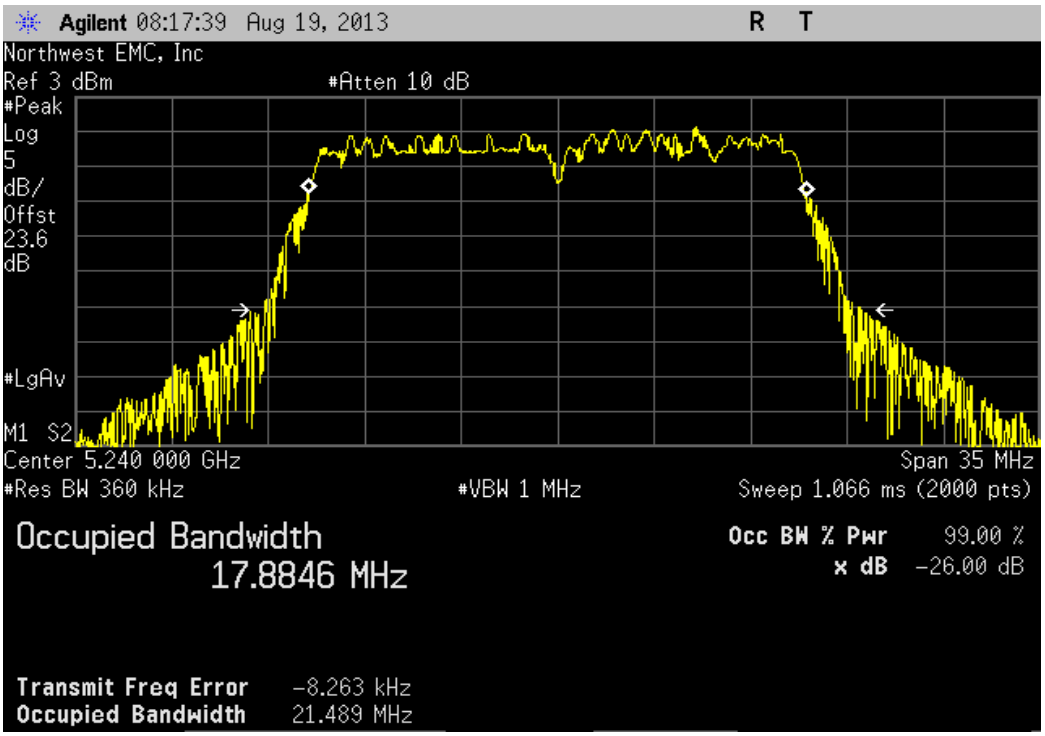
20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				21.317 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

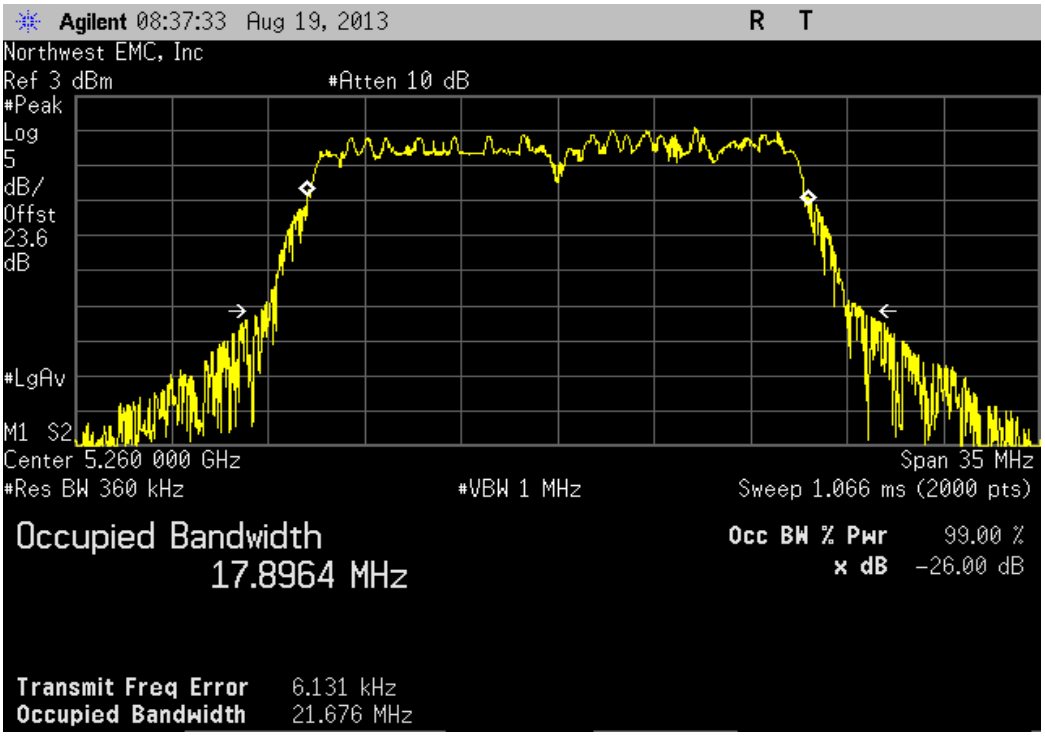
20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				21.489 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz

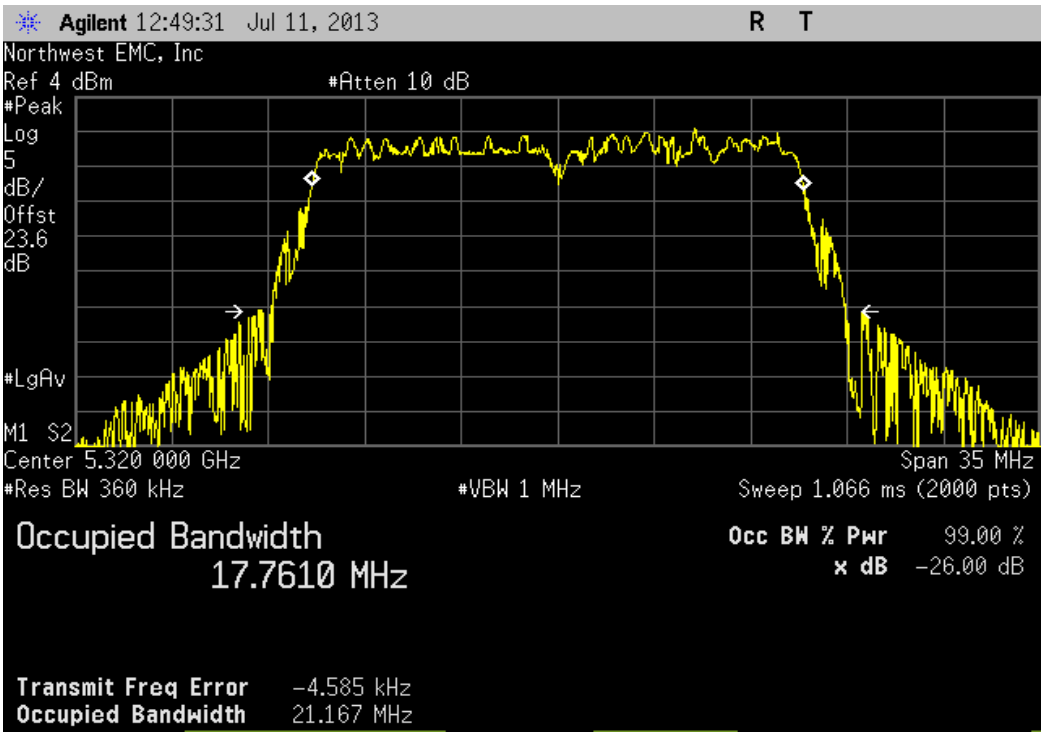
				Value	Limit	Result
				21.676 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

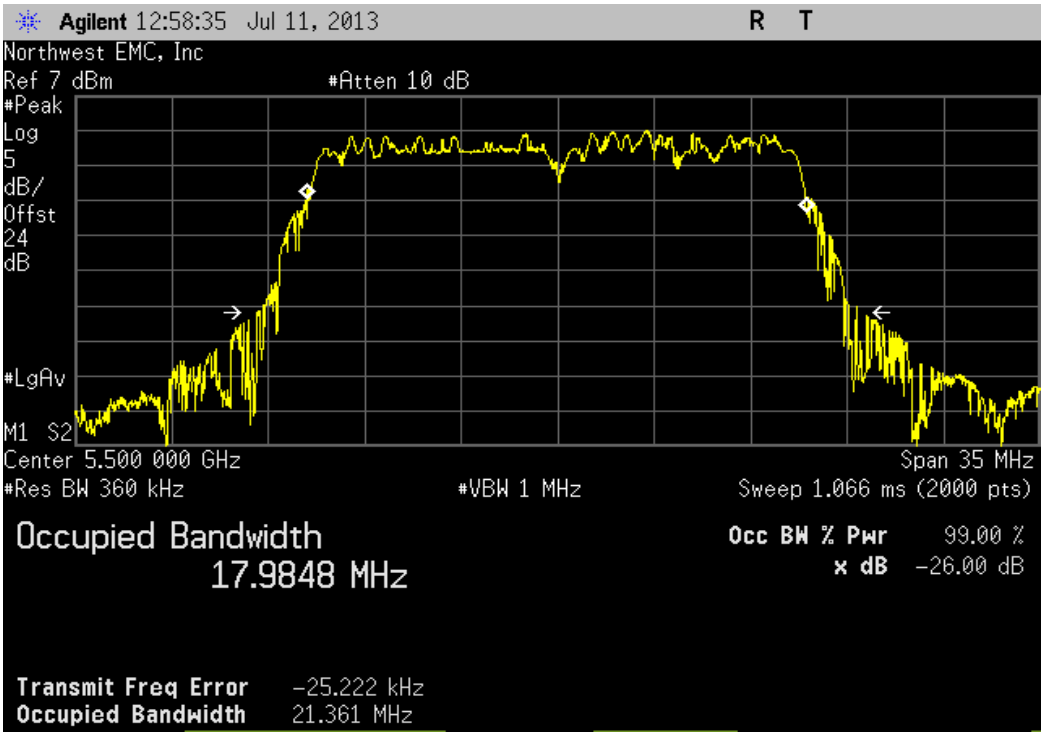
20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				21.167 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz

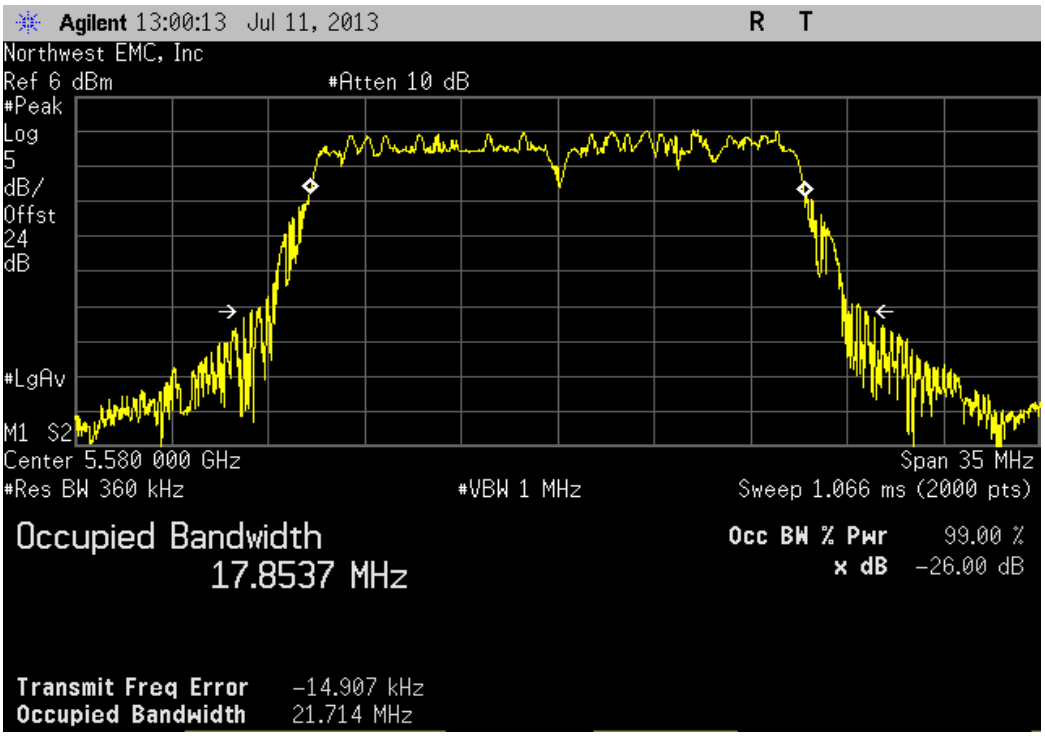
				Value	Limit	Result
				21.361 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

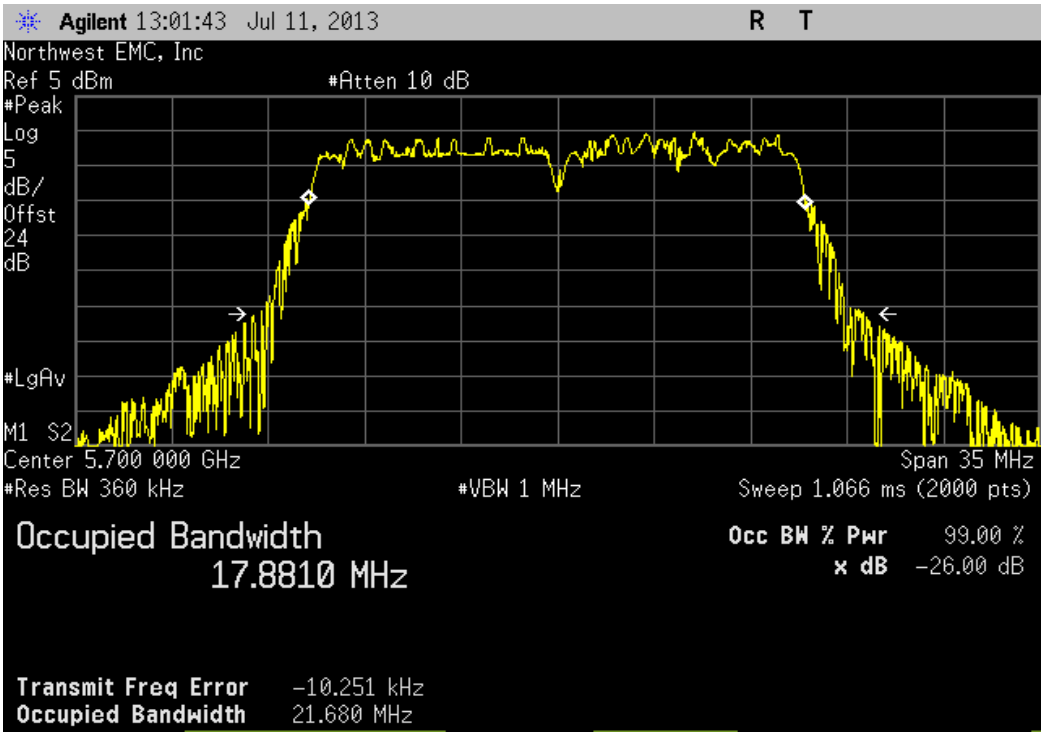
20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				21.714 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz

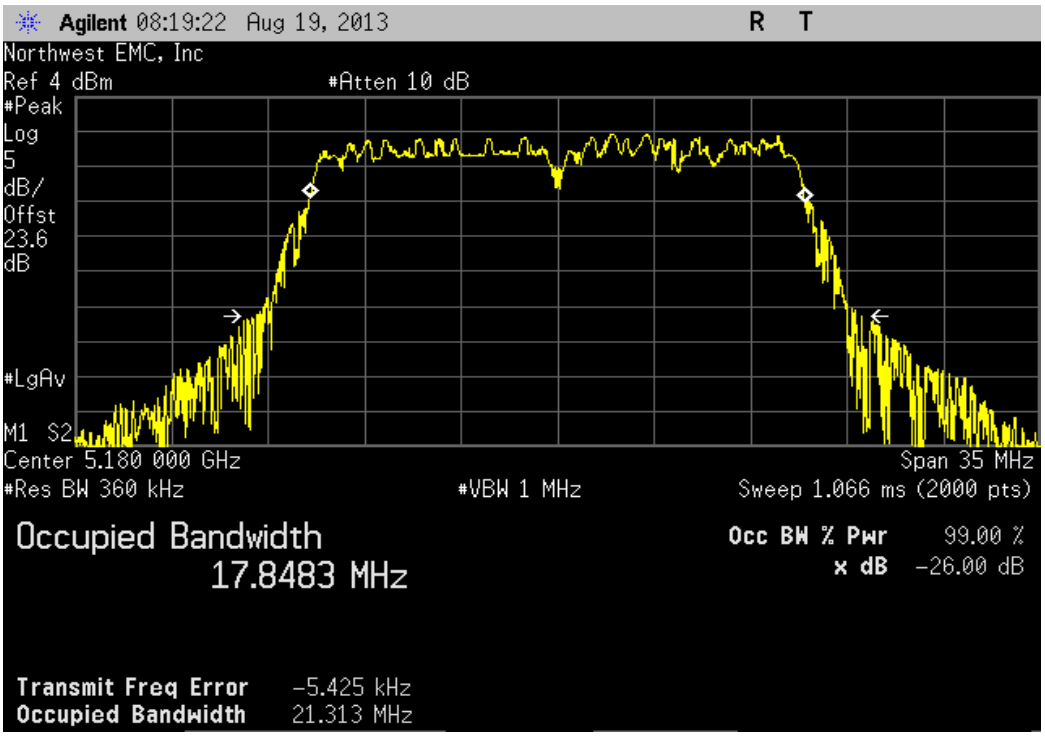
				Value	Limit	Result
				21.68 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

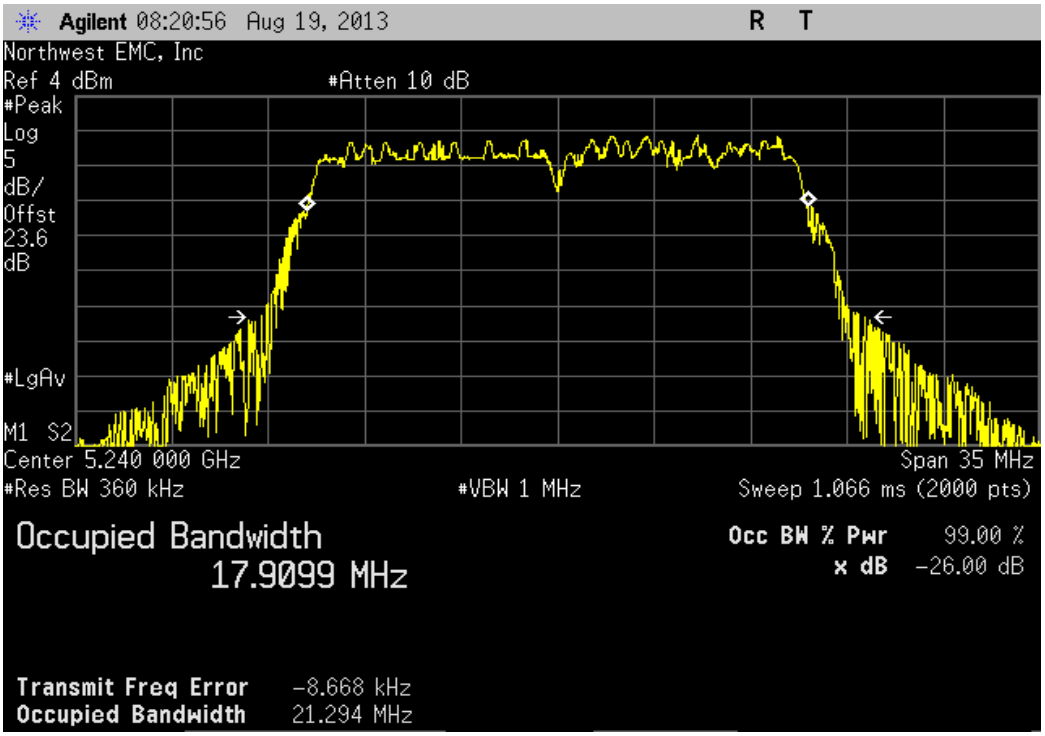
20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				21.313 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz

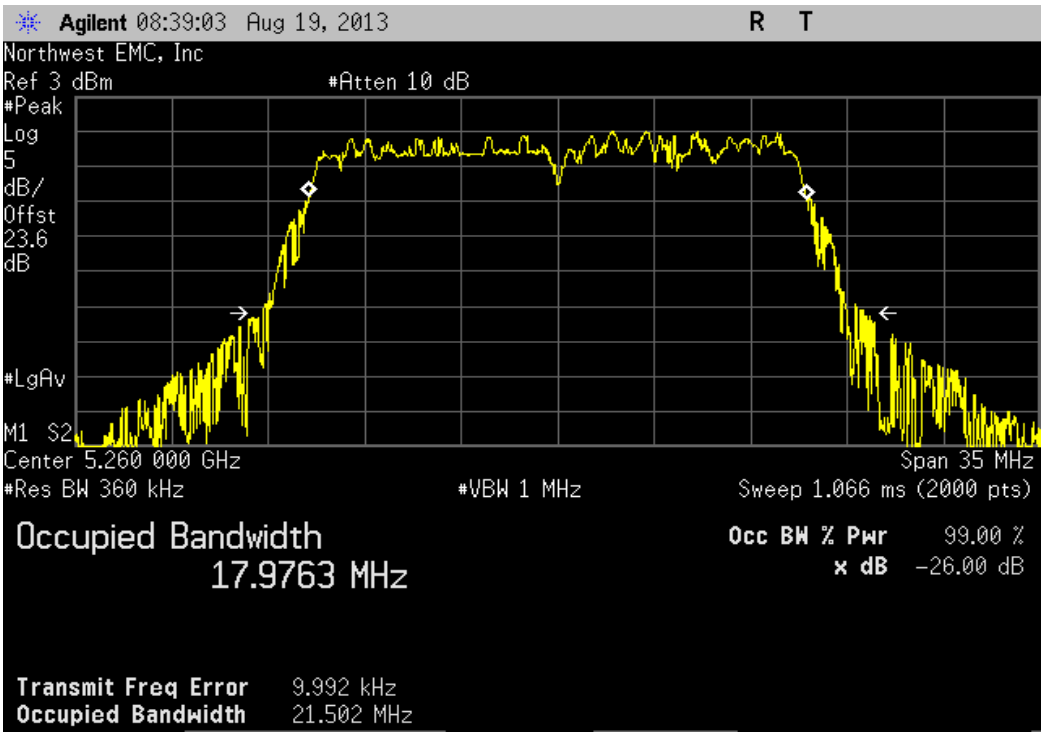
				Value	Limit	Result
				21.294 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

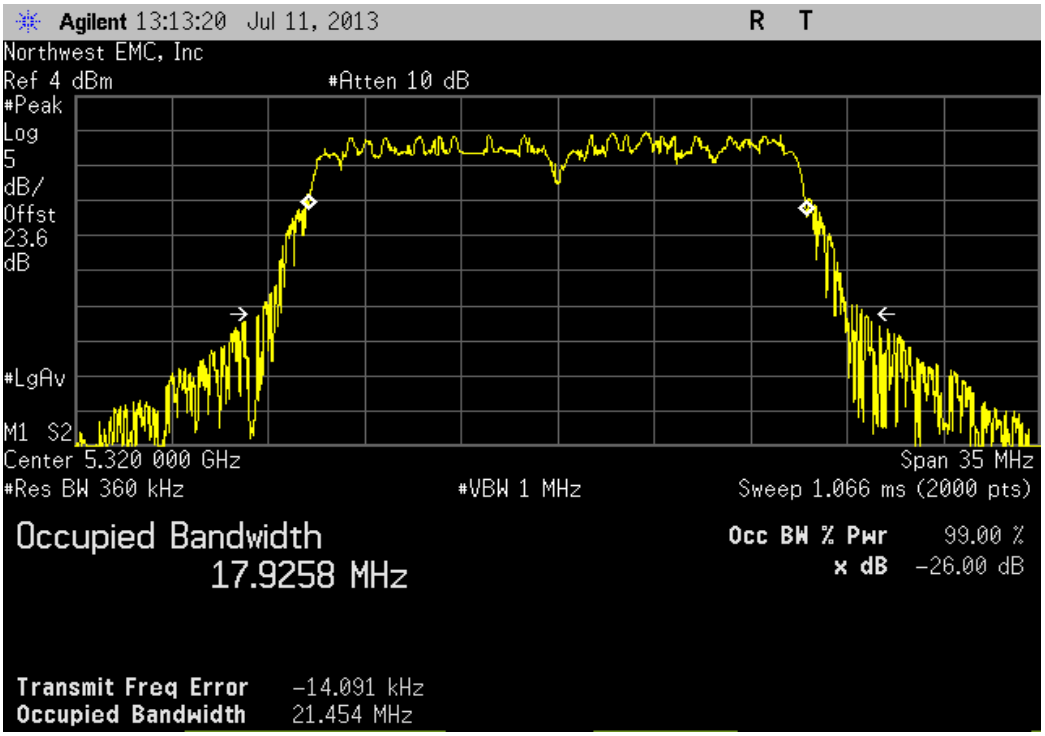
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				21.502 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

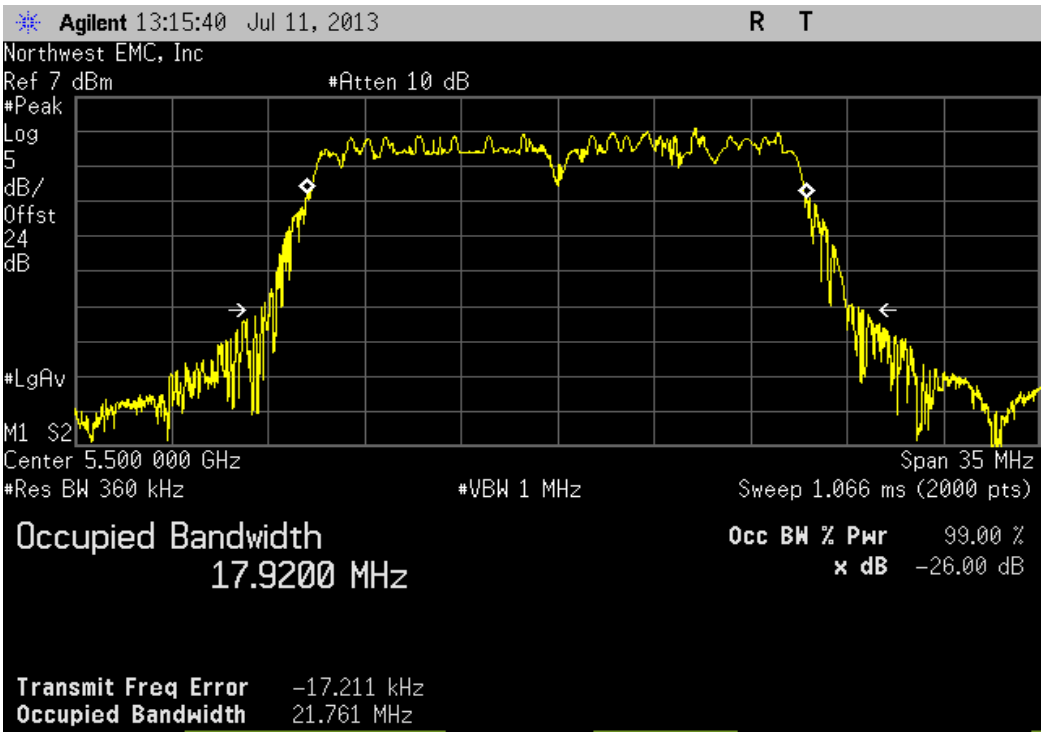
				Value	Limit	Result
				21.454 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

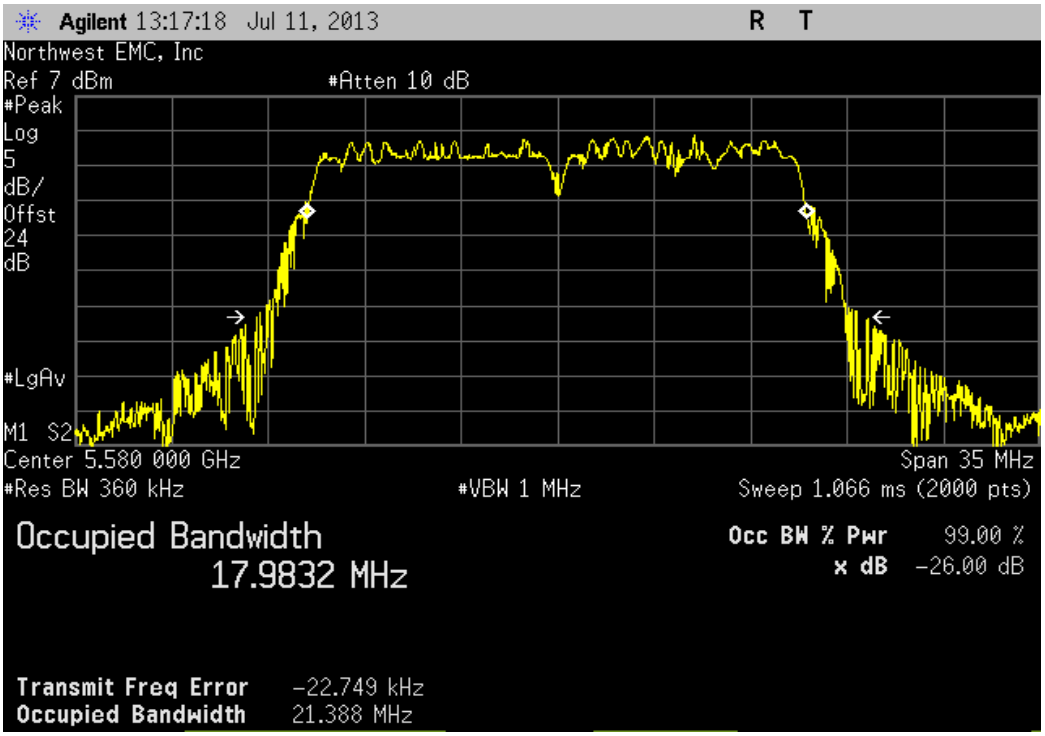
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				21.761 MHz	> 500 kHz	Pass



20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz

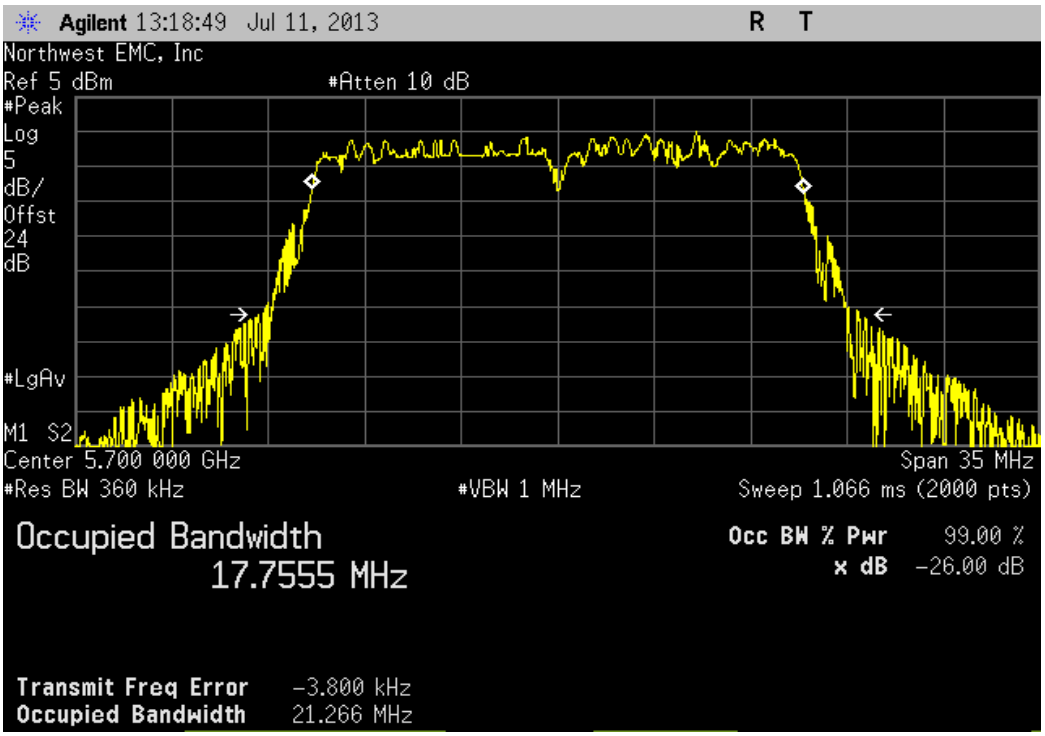
				Value	Limit	Result
				21.388 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

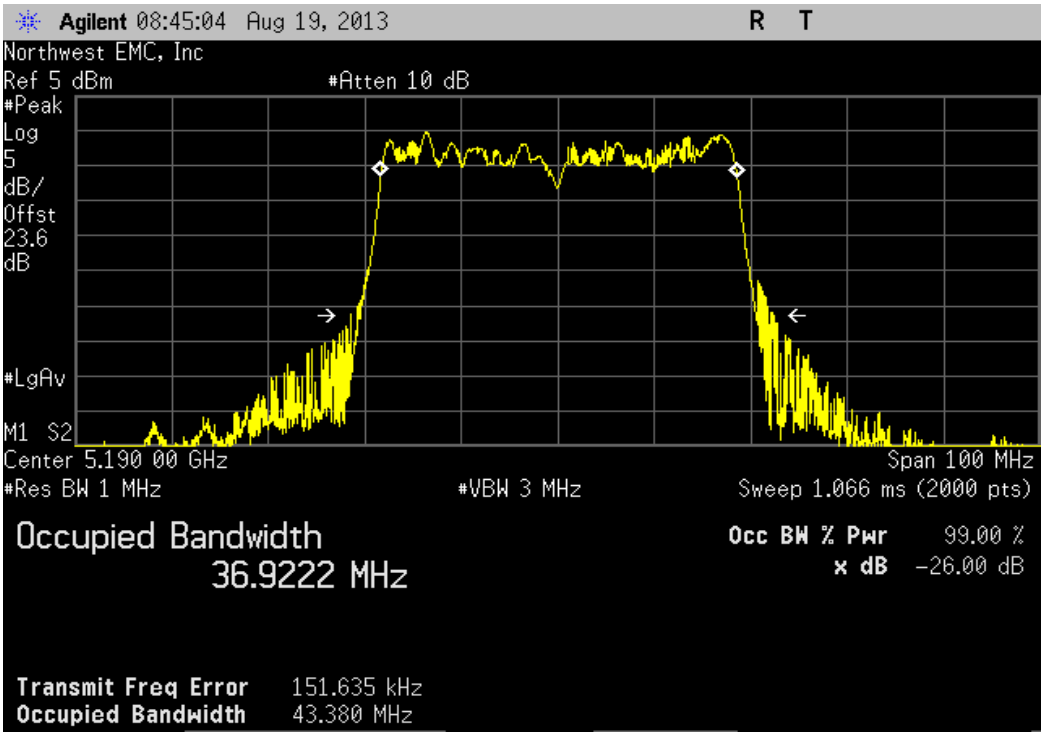
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				21.266 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS0, Ch 36/40, Low Channel 5190 MHz

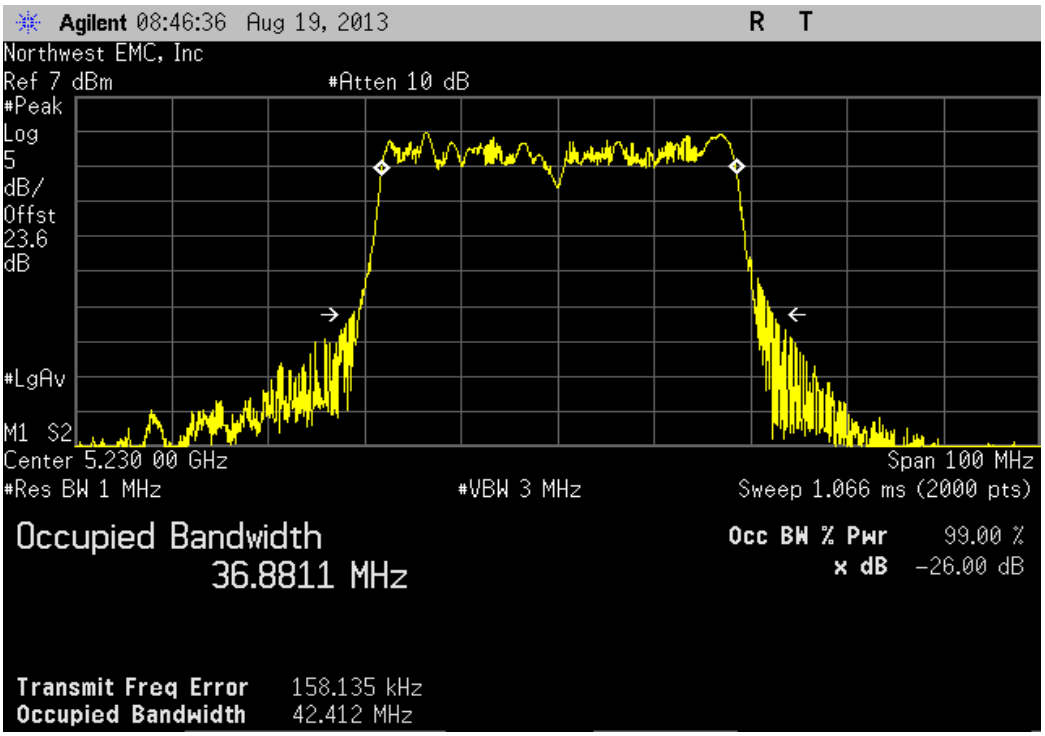
				Value	Limit	Result
				43.38 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

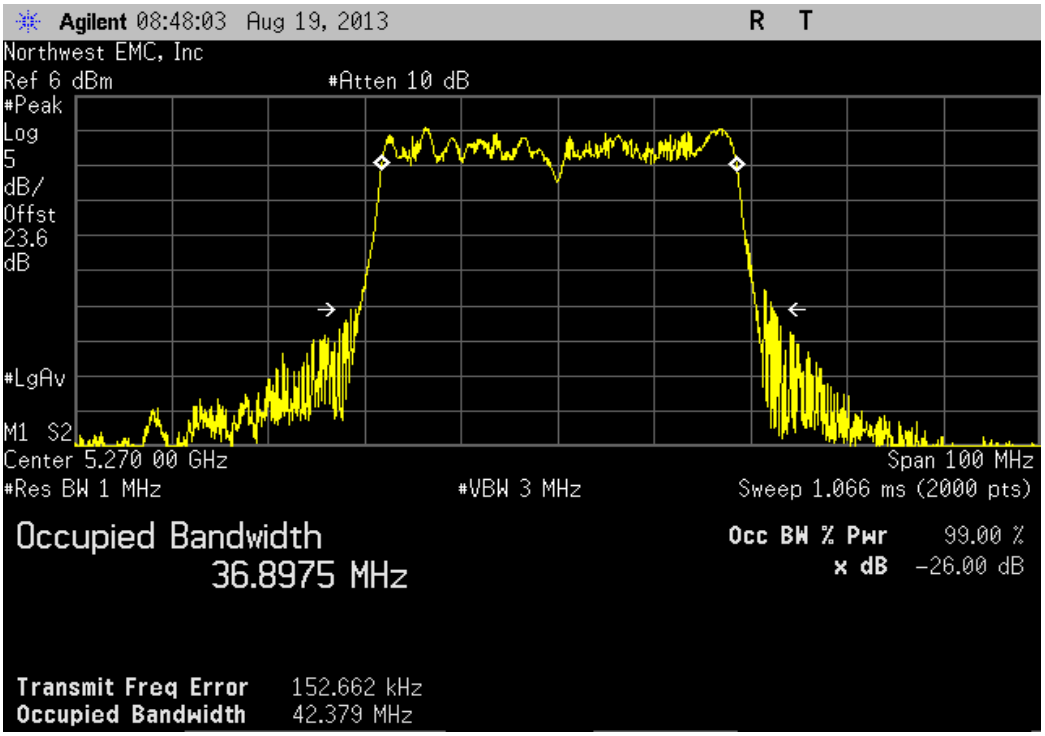
40 MHz, 802.11(n) MCS0, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				42.412 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS0, Ch 52/56, Low Channel 5270 MHz

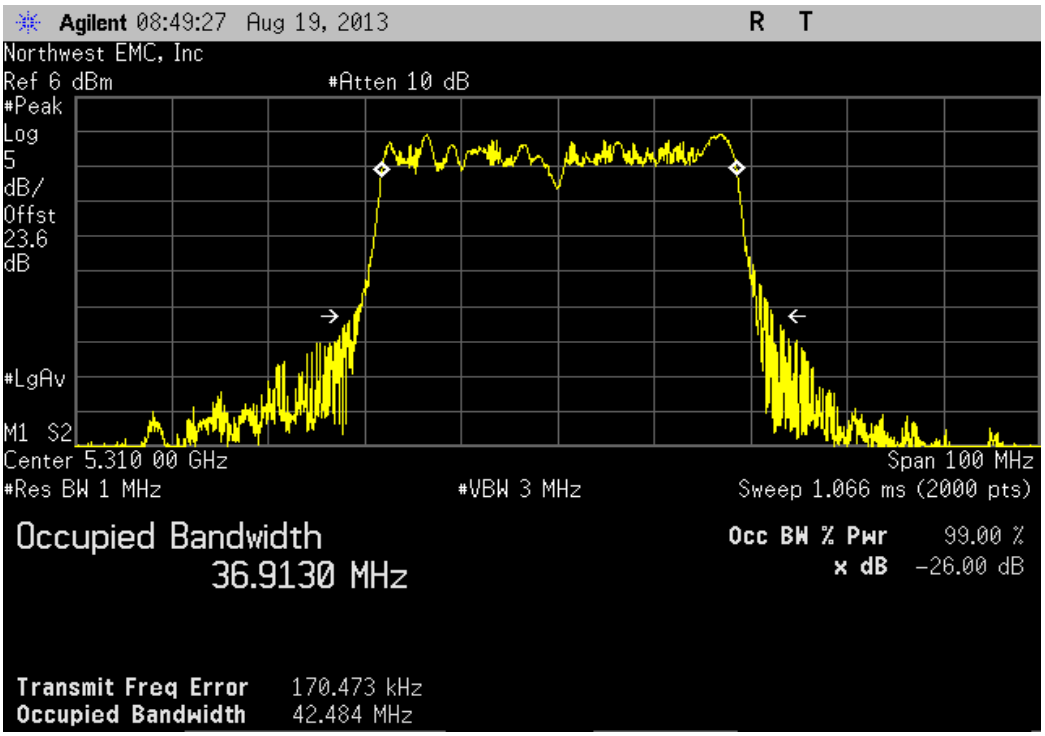
				Value	Limit	Result
				42.379 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

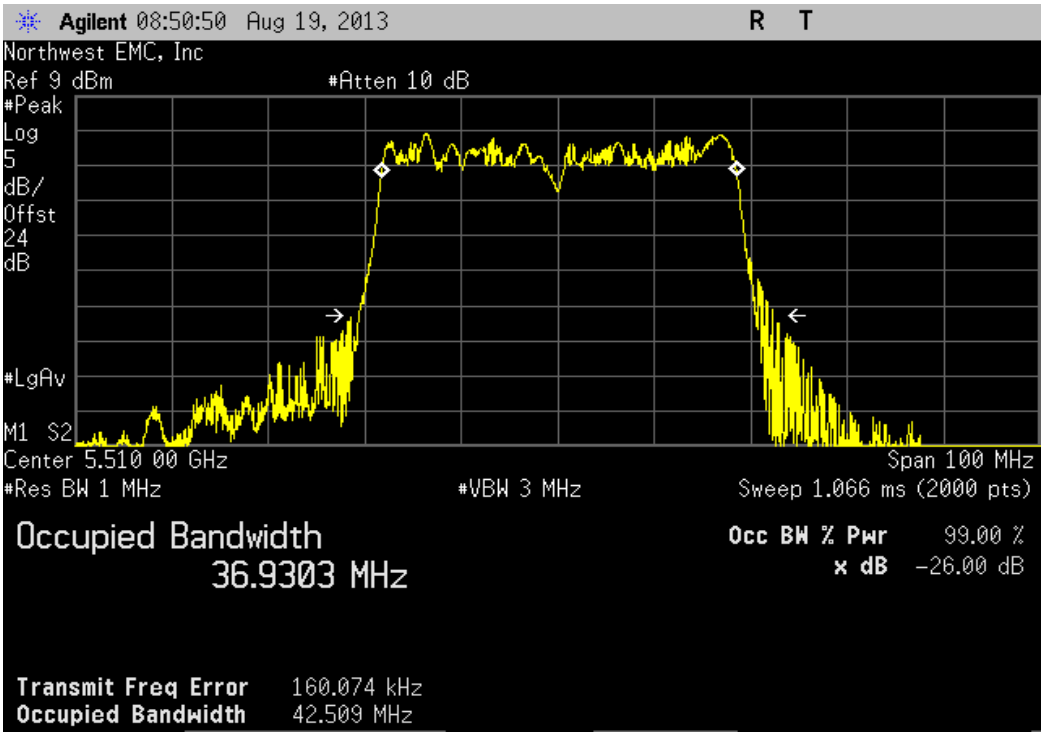
40 MHz, 802.11(n) MCS0, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				42.484 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS0, Ch 100/104, Low Channel 5510 MHz

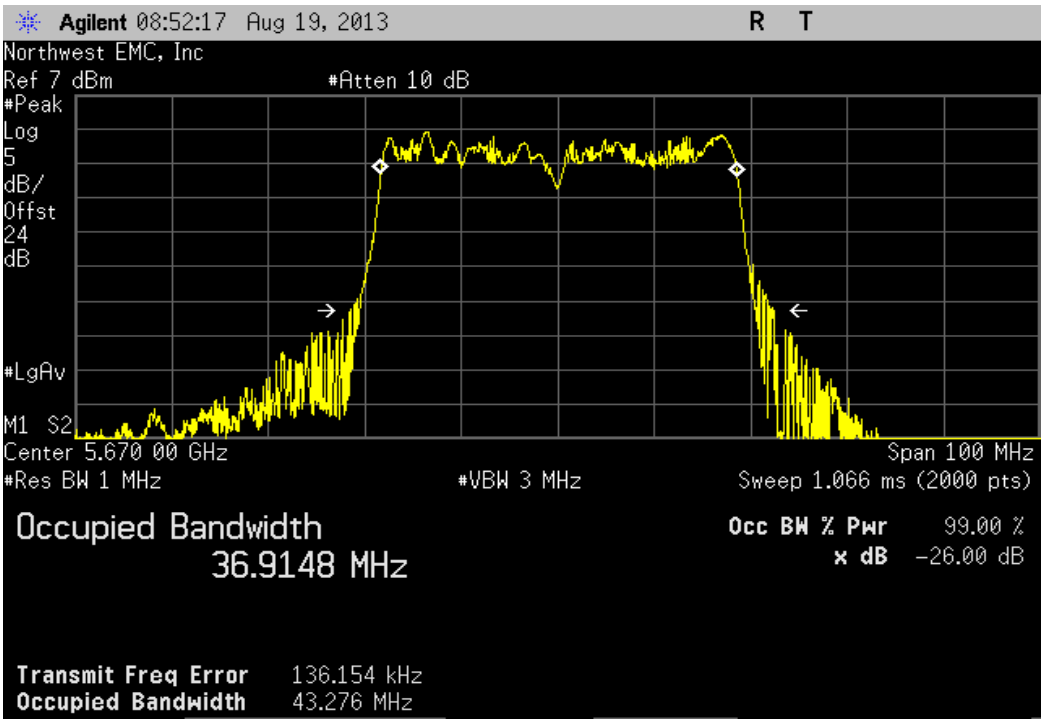
				Value	Limit	Result
				42.509 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

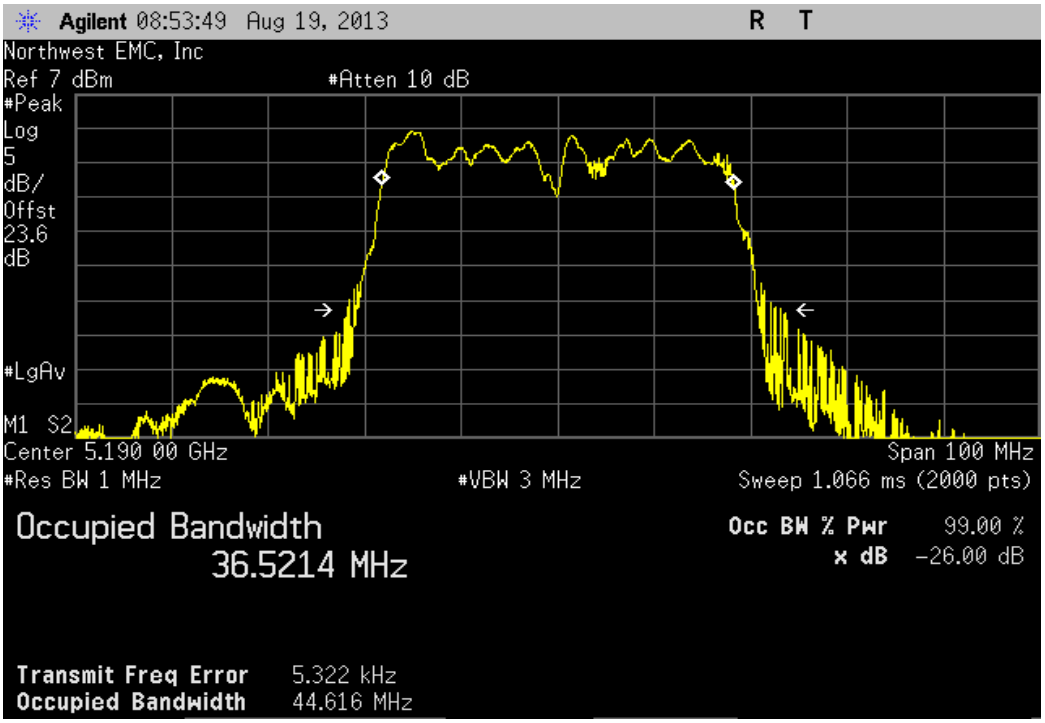
40 MHz, 802.11(n) MCS0, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				43.276 MHz	> 500 kHz	Pass



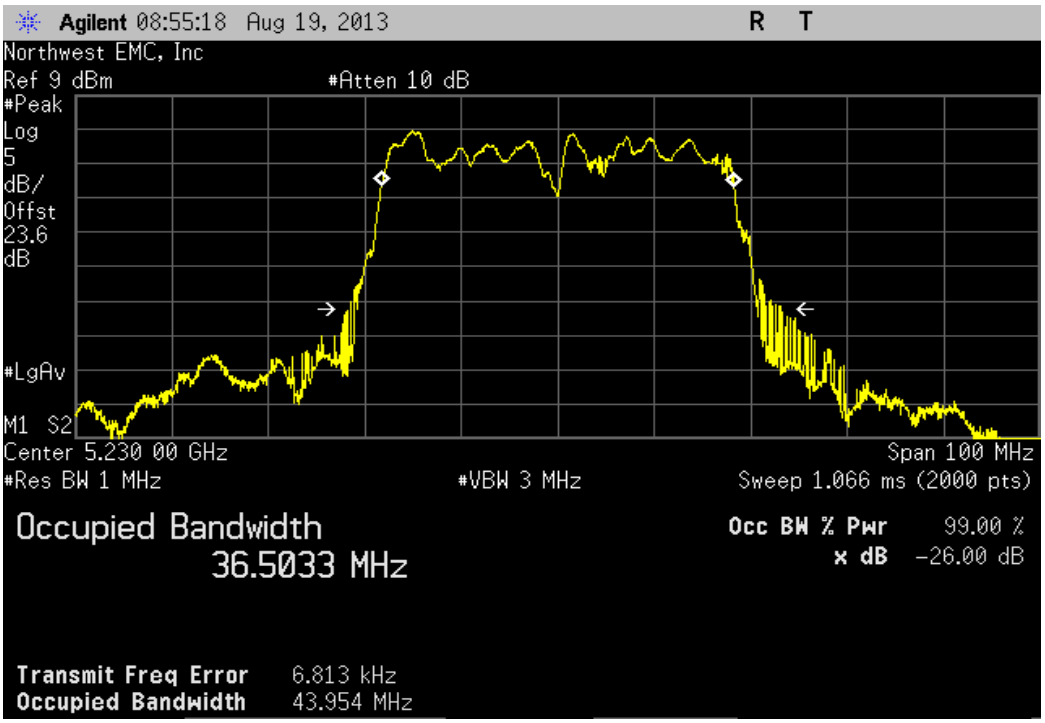
40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				44.616 MHz	> 500 kHz	Pass

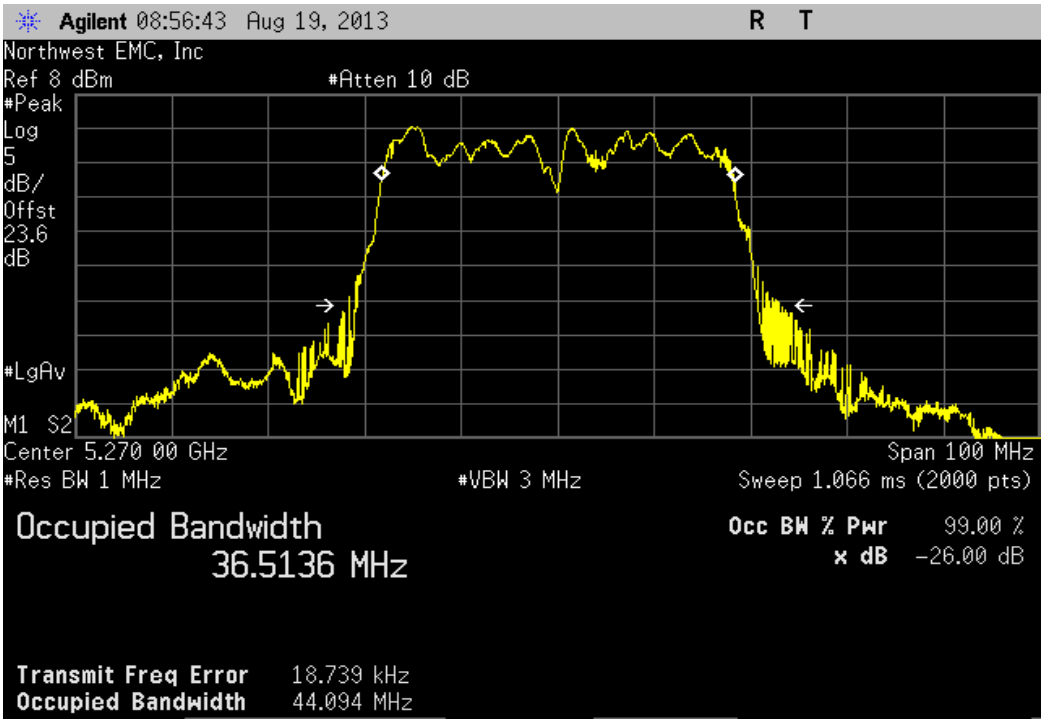


Emission Bandwidth - Antenna B

40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz						
				Value	Limit	Result
				43.954 MHz	> 500 kHz	Pass



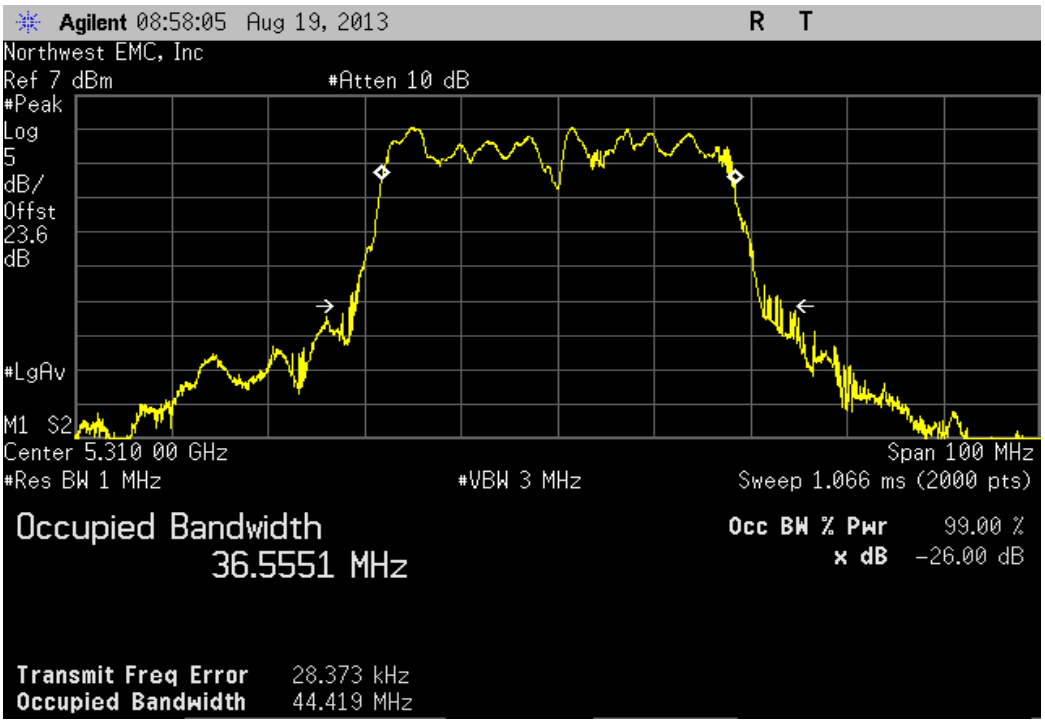
40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	Result
				44.094 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

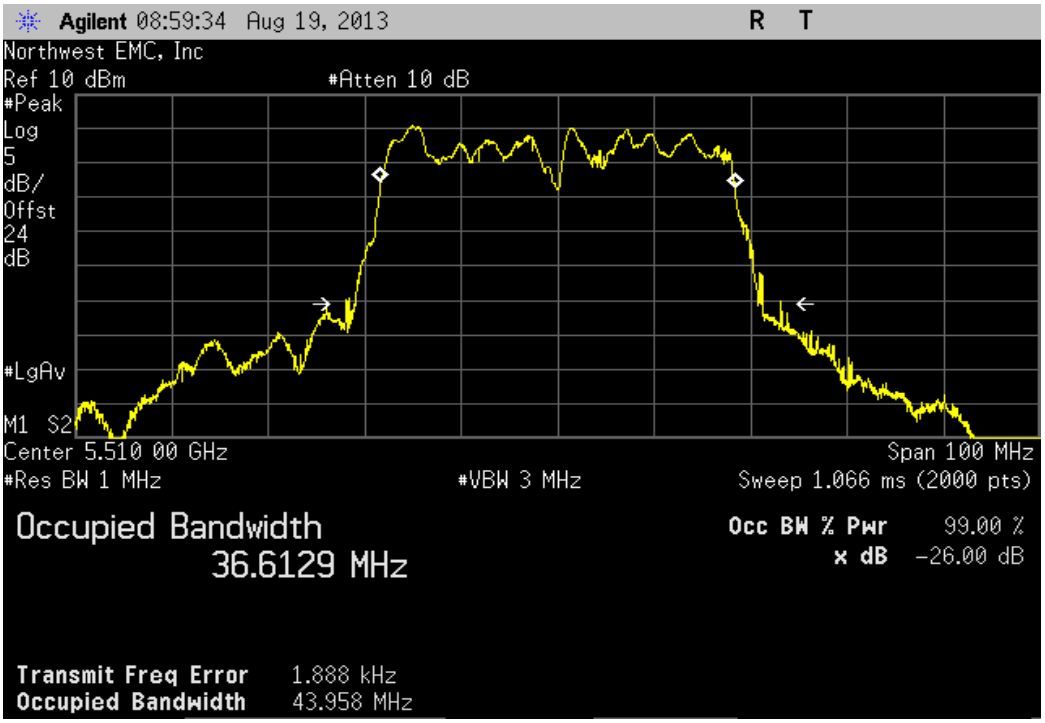
40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				44.419 MHz	> 500 kHz	Pass



40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz

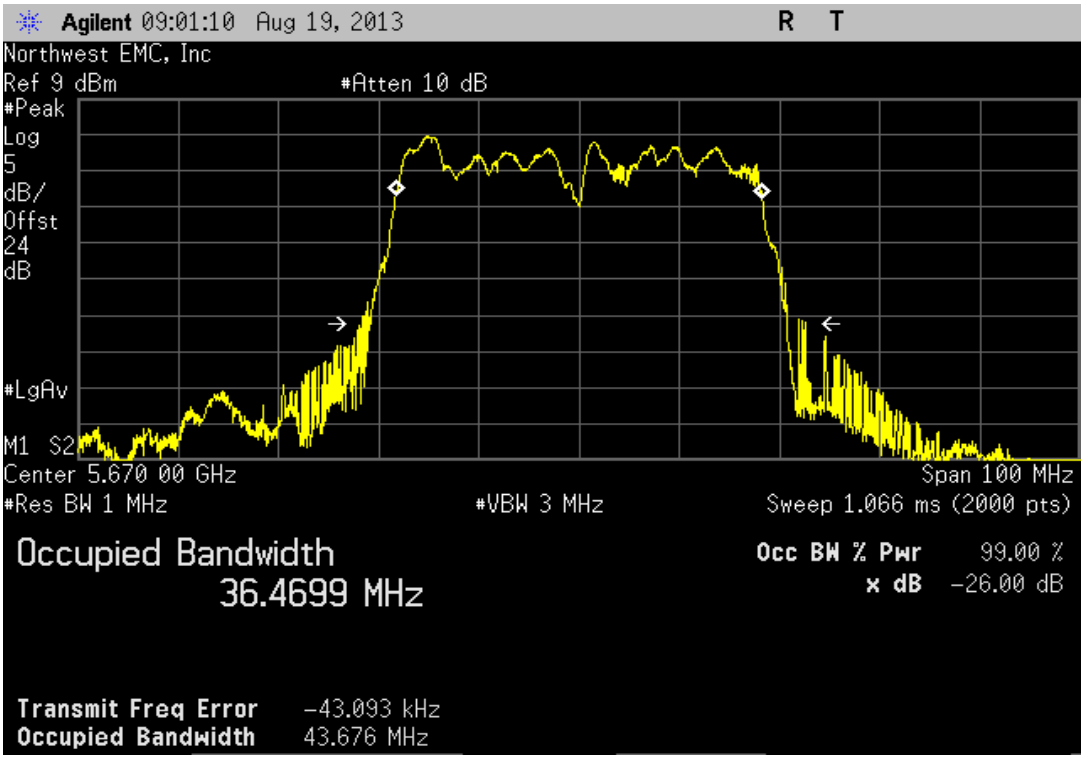
				Value	Limit	Result
				43.958 MHz	> 500 kHz	Pass



Emission Bandwidth - Antenna B

40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				43.676 MHz	> 500 kHz	Pass



Peak Power Spectral Density - Antenna A-B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW ≥ 3 MHz
- Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Peak Power Spectral Density - Antenna A-B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel. Adapter cable loss of 1.3 dB added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

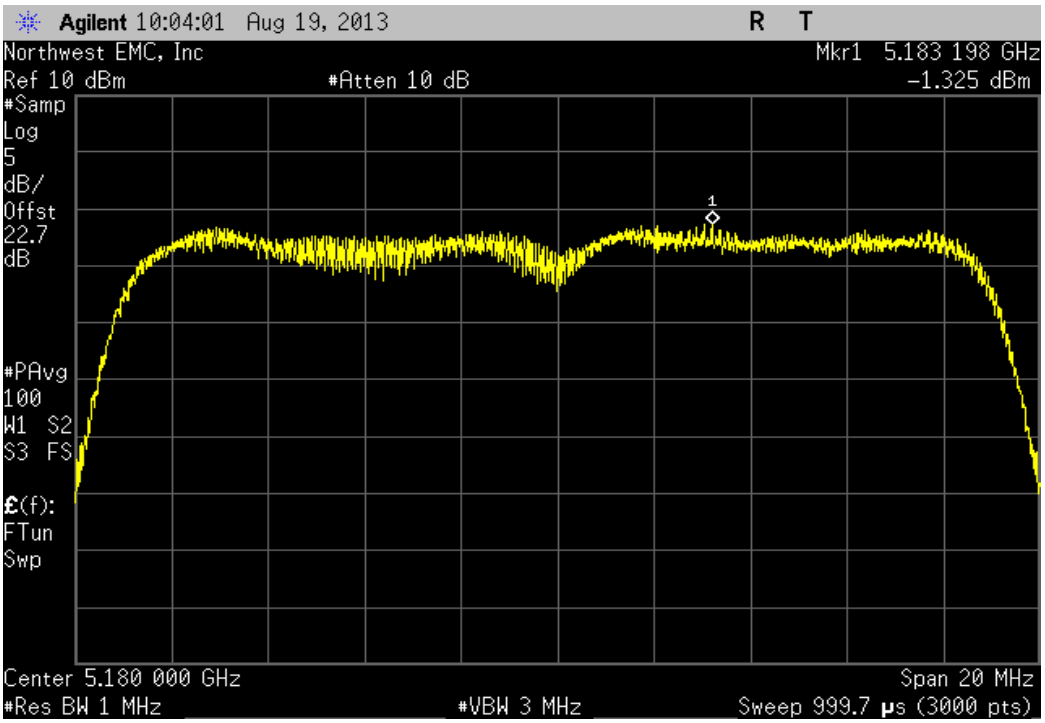
			Value (dBm / MHz)	Limit (dBm / MHz)
Chain A				
	20 MHz			
		802.11(n) MCS15		
		Ch 36, Low Channel 5180 MHz	-1.325	4
		Ch 48, High Channel 5240 MHz	-2.068	4
		Ch 52, Low Channel 5260 MHz	-2.176	11
		Ch 64, High Channel 5320 MHz	-2.132	11
		Ch 100, Low Channel 5500 MHz	1.156	11
		Ch 116, Mid Channel 5580 MHz	0.886	11
		Ch 140, High Channel 5700 MHz	-0.227	11
	40 MHz			
		802.11(n) MCS15		
		Ch 36/40, Low Channel 5190 MHz	-5.366	4
		Ch 44/48, High Channel 5230 MHz	-2.313	4
		Ch 52/56, Low Channel 5270 MHz	-2.956	11
		Ch 60/64, High Channel 5310 MHz	-4.364	11
		Ch 100/104, Low Channel 5510 MHz	-0.837	11
		Ch 132/136, High Channel 5670 MHz	-2.467	11
Chain B				
	20 MHz			
		802.11(n) MCS15		
		Ch 36, Low Channel 5180 MHz	-2.049	4
		Ch 48, High Channel 5240 MHz	-3.301	4
		Ch 52, Low Channel 5260 MHz	-3.87	11
		Ch 64, High Channel 5320 MHz	-2.693	11
		Ch 100, Low Channel 5500 MHz	0.628	11
		Ch 116, Mid Channel 5580 MHz	-0.789	11
		Ch 140, High Channel 5700 MHz	-2.733	11
	40 MHz			
		802.11(n) MCS15		
		Ch 36/40, Low Channel 5190 MHz	-6.14	4
		Ch 44/48, High Channel 5230 MHz	-4.557	4
		Ch 52/56, Low Channel 5270 MHz	-4.013	11
		Ch 60/64, High Channel 5310 MHz	-4.992	11
		Ch 100/104, Low Channel 5510 MHz	-2.677	11
		Ch 132/136, High Channel 5670 MHz	-5.35	11

			Value (dBm / MHz)	Summing Factor (dBm)	Summed Value (dBm / MHz)	Limit (dBm / MHz)	Result
Chain A Summing							
	20 MHz						
		802.11(n) MCS15					
		Ch 36, Low Channel 5180 MHz	-1.325	3	1.675	4	Pass
		Ch 48, High Channel 5240 MHz	-2.068	3	0.932	4	Pass
		Ch 52, Low Channel 5260 MHz	-2.176	3	0.824	11	Pass
		Ch 64, High Channel 5320 MHz	-2.132	3	0.868	11	Pass
		Ch 100, Low Channel 5500 MHz	1.156	3	4.156	11	Pass
		Ch 116, Mid Channel 5580 MHz	0.886	3	3.886	11	Pass
		Ch 140, High Channel 5700 MHz	-0.227	3	2.773	11	Pass
	40 MHz						
		802.11(n) MCS15					
		Ch 36/40, Low Channel 5190 MHz	-5.366	3	-2.366	4	Pass
		Ch 44/48, High Channel 5230 MHz	-2.313	3	0.687	4	Pass
		Ch 52/56, Low Channel 5270 MHz	-2.956	3	0.044	11	Pass
		Ch 60/64, High Channel 5310 MHz	-4.364	3	-1.364	11	Pass
		Ch 100/104, Low Channel 5510 MHz	-0.837	3	2.163	11	Pass
		Ch 132/136, High Channel 5670 MHz	-2.467	3	0.533	11	Pass

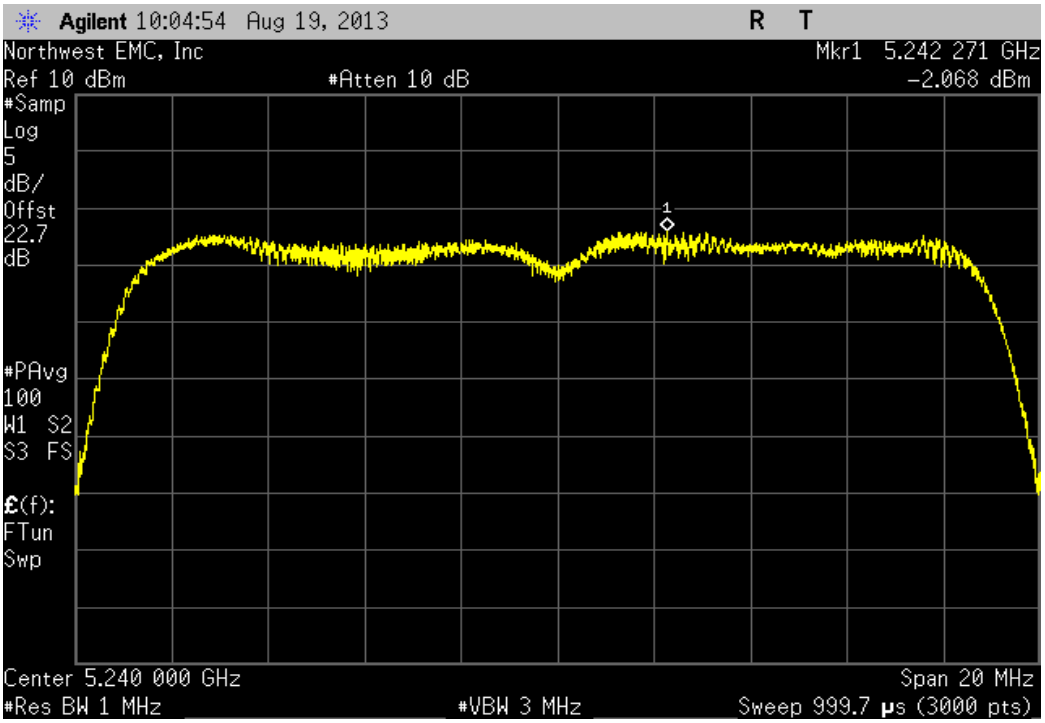
			Value (dBm / MHz)	Summing Factor (dBm)	Summed Value (dBm / MHz)	Limit (dBm / MHz)	Result
Chain B Summing							
	20 MHz						
		802.11(n) MCS15					
		Ch 36, Low Channel 5180 MHz	-2.049	3	0.951	4	Pass
		Ch 48, High Channel 5240 MHz	-3.301	3	-0.301	4	Pass
		Ch 52, Low Channel 5260 MHz	-3.87	3	-0.87	11	Pass
		Ch 64, High Channel 5320 MHz	-2.693	3	0.307	11	Pass
		Ch 100, Low Channel 5500 MHz	0.628	3	3.628	11	Pass
		Ch 116, Mid Channel 5580 MHz	-0.789	3	2.211	11	Pass
		Ch 140, High Channel 5700 MHz	-2.733	3	0.267	11	Pass
	40 MHz						
		802.11(n) MCS15					
		Ch 36/40, Low Channel 5190 MHz	-6.14	3	-3.14	4	Pass
		Ch 44/48, High Channel 5230 MHz	-4.557	3	-1.557	4	Pass
		Ch 52/56, Low Channel 5270 MHz	-4.013	3	-1.013	11	Pass
		Ch 60/64, High Channel 5310 MHz	-4.992	3	-1.992	11	Pass
		Ch 100/104, Low Channel 5510 MHz	-2.677	3	0.323	11	Pass
		Ch 132/136, High Channel 5670 MHz	-5.35	3	-2.35	11	Pass

Peak Power Spectral Density - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-1.325	4	Pass

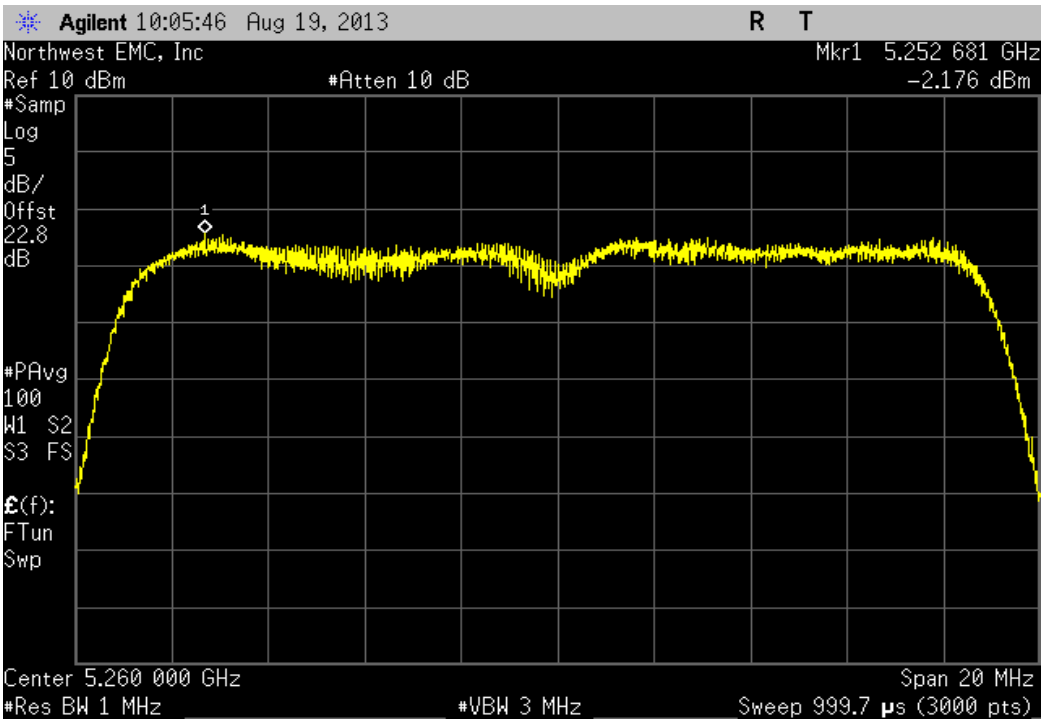


Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.068	4	Pass

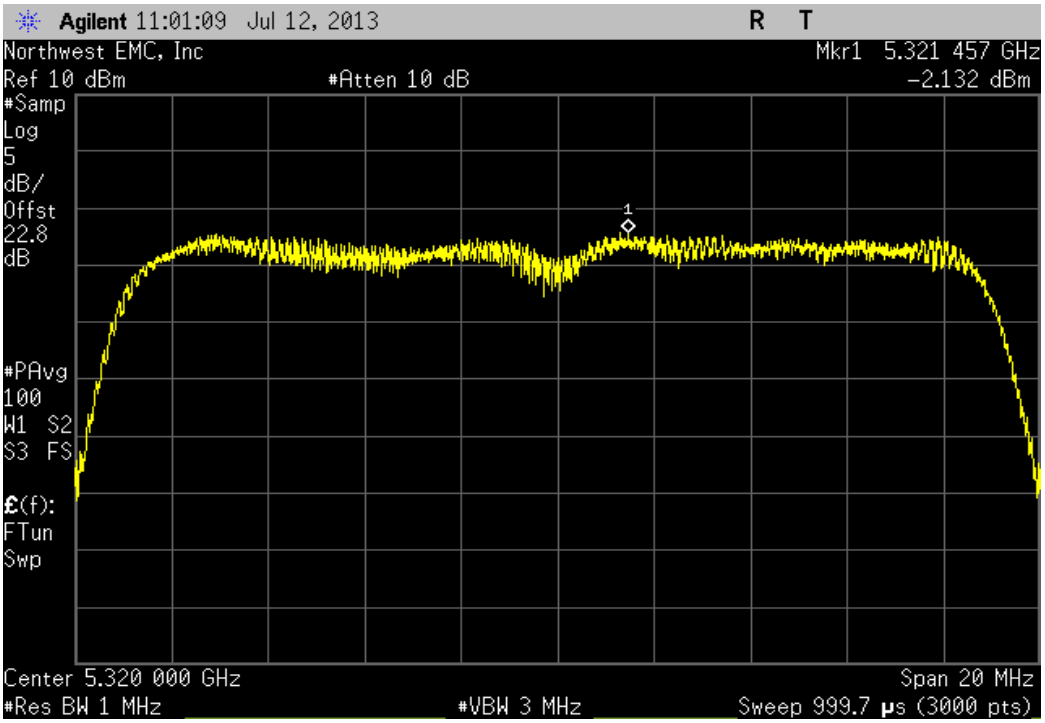


Peak Power Spectral Density - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.176	4	Pass

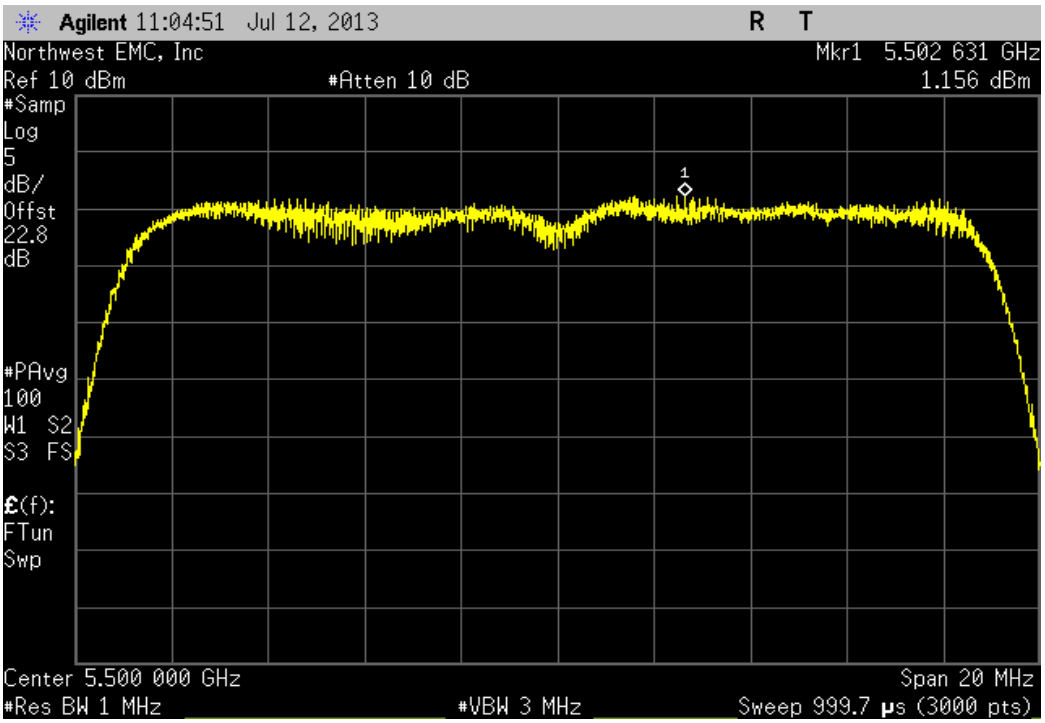


Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.132	4	Pass

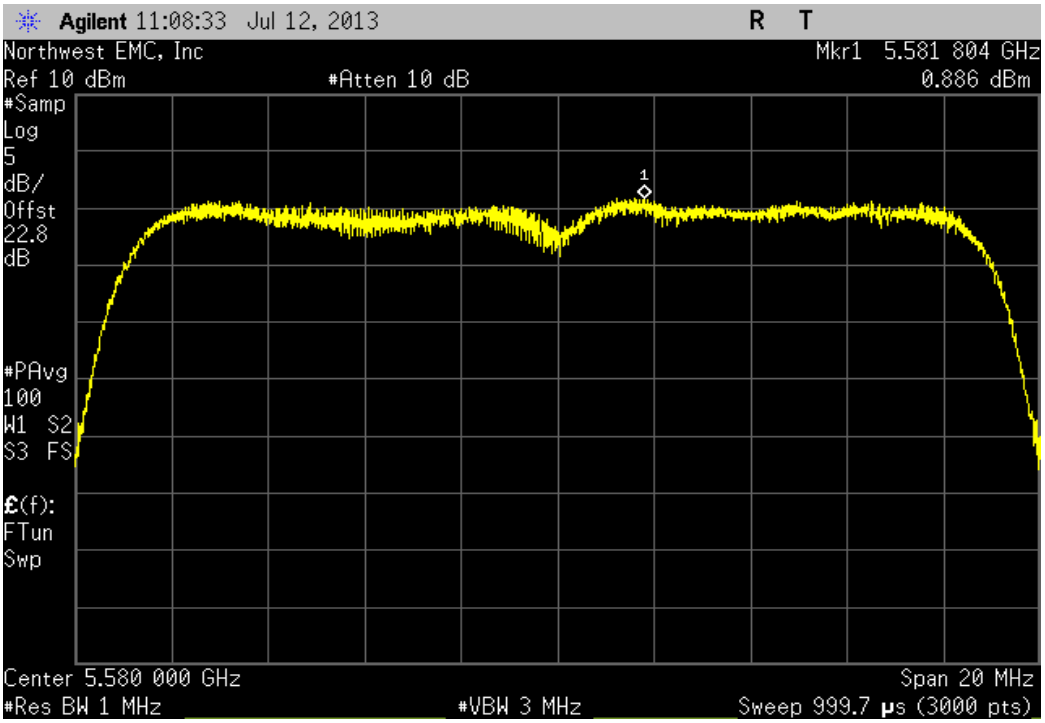


Peak Power Spectral Density - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				1.156	4	Pass

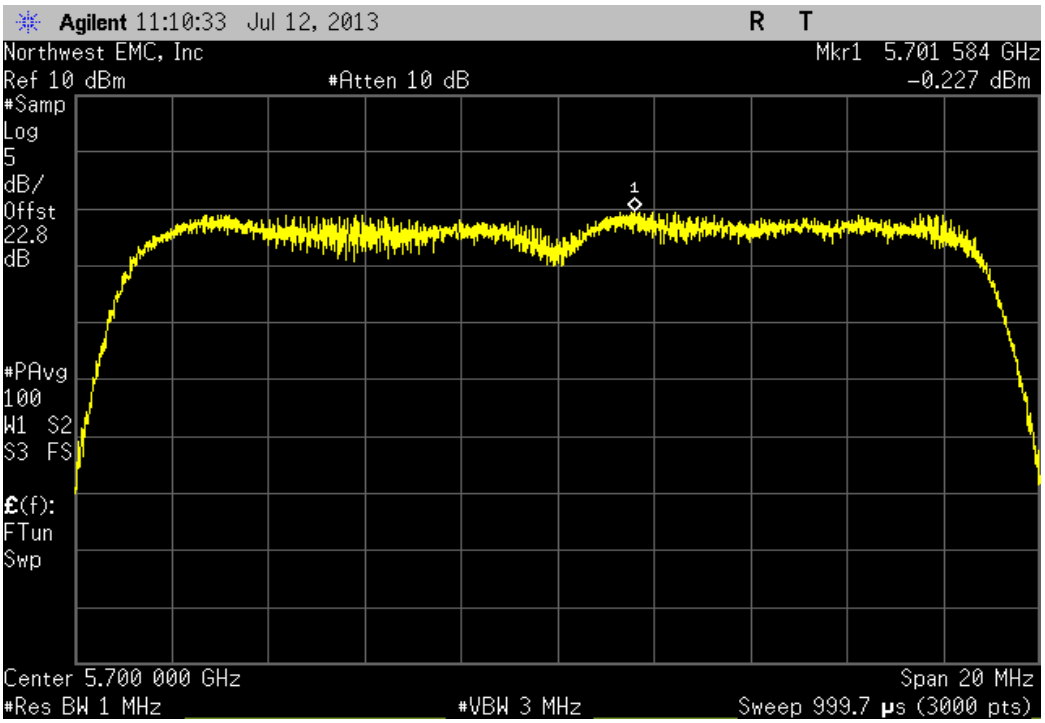


Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				0.886	4	Pass

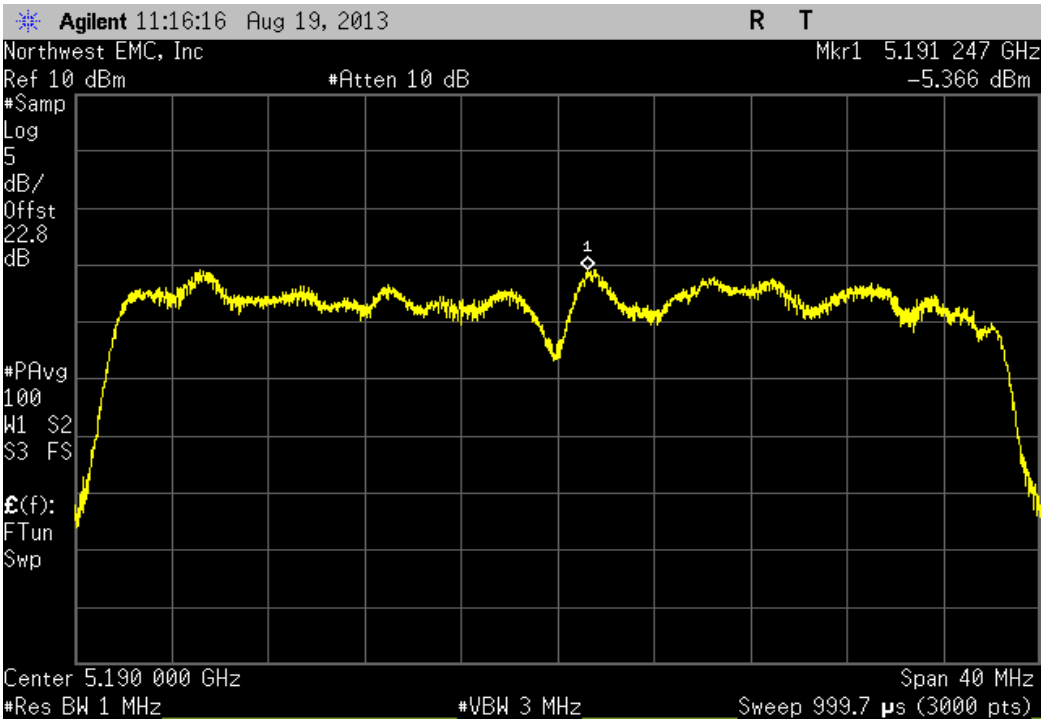


Peak Power Spectral Density - Antenna A-B

Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-0.227	4	Pass

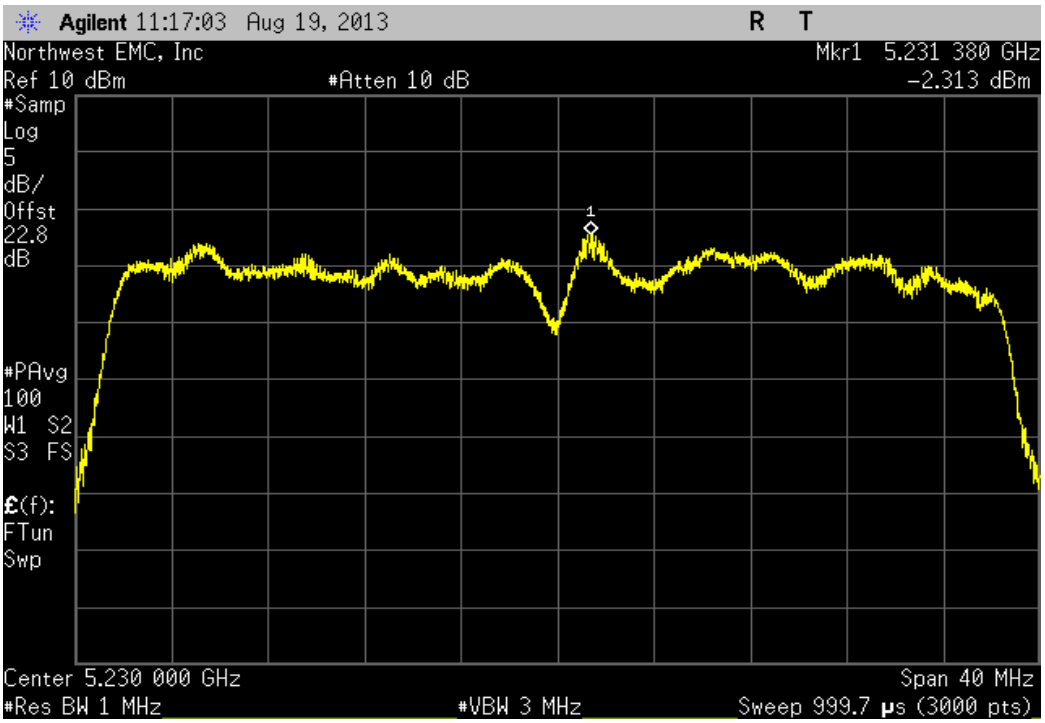


Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-5.366	4	Pass

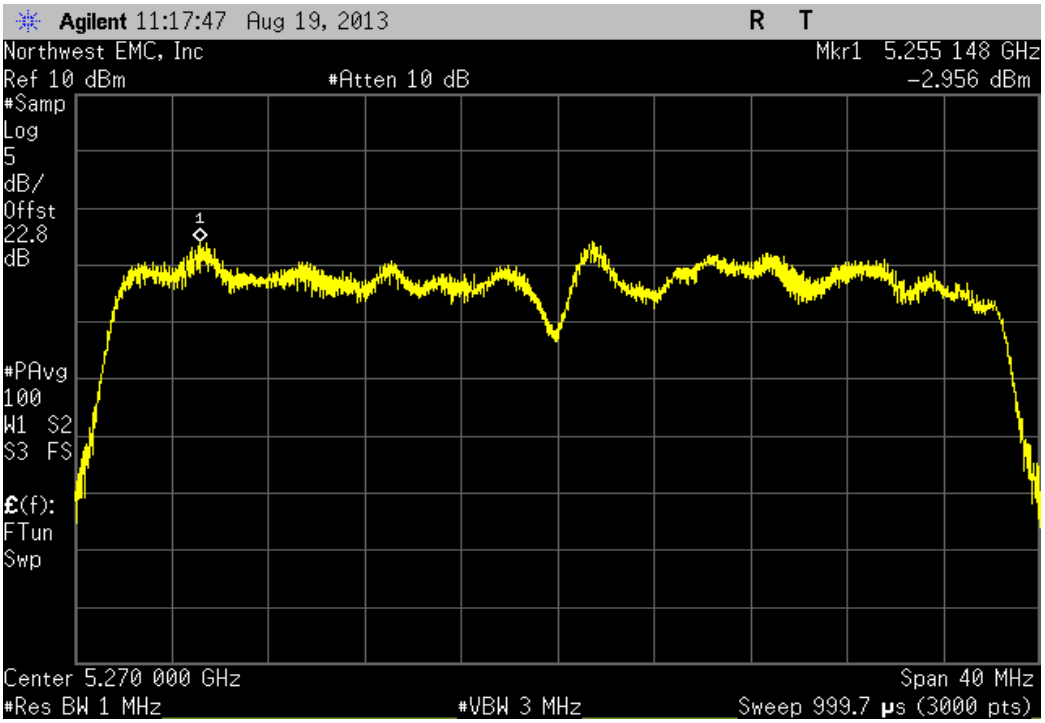


Peak Power Spectral Density - Antenna A-B

Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.313	4	Pass

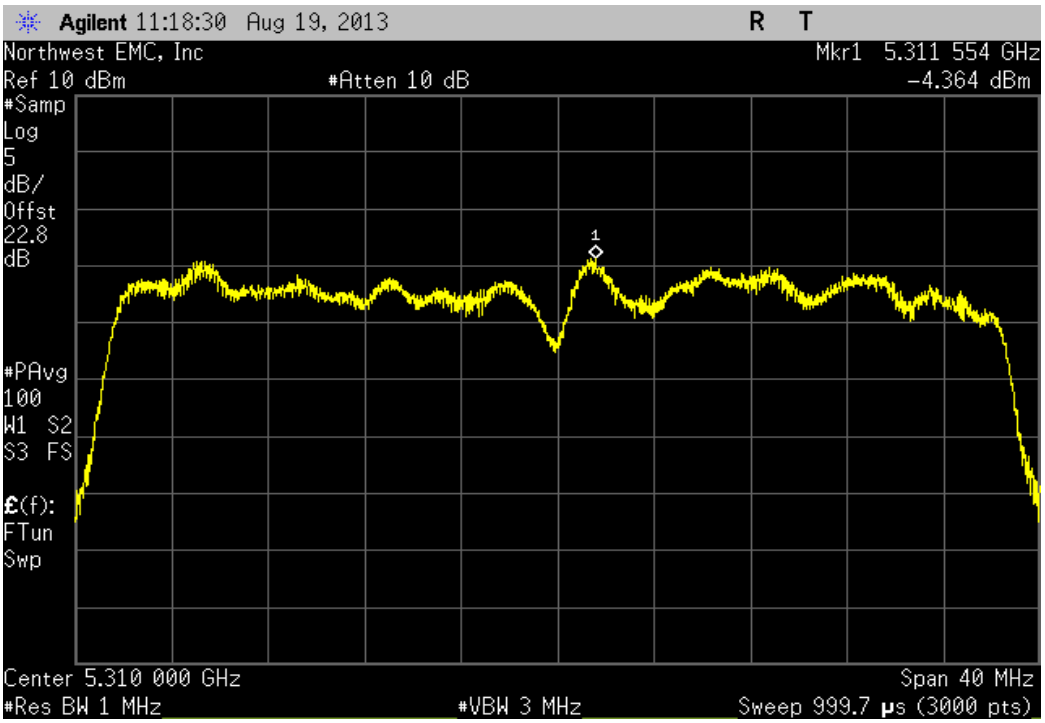


Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.956	4	Pass

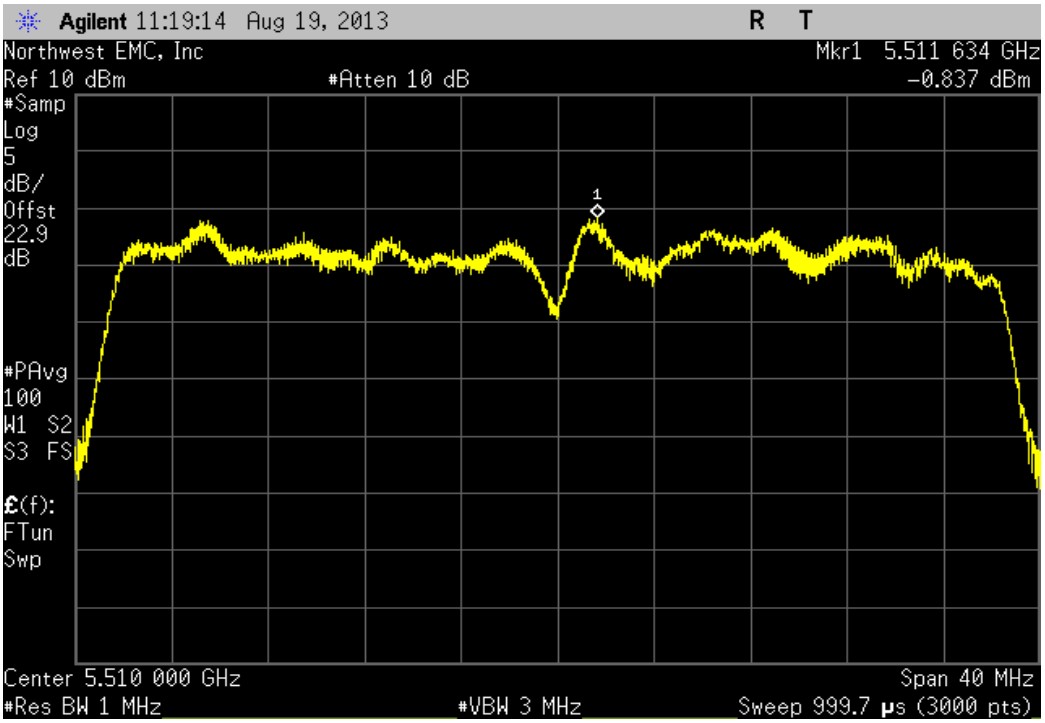


Peak Power Spectral Density - Antenna A-B

Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-4.364	4	Pass

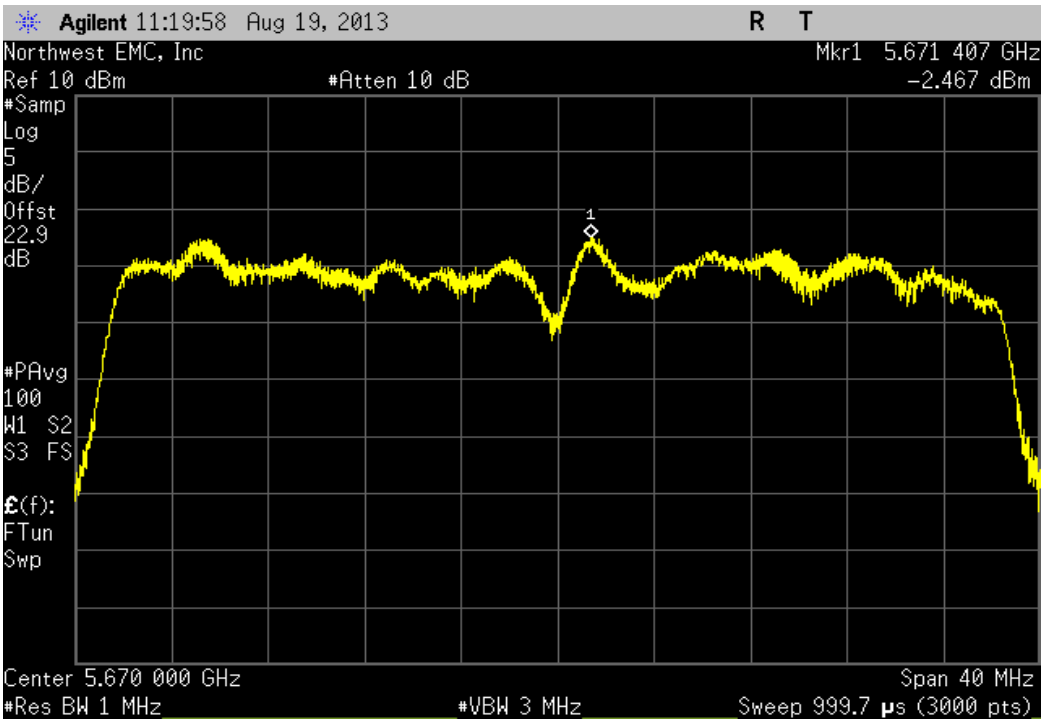


Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-0.837	4	Pass

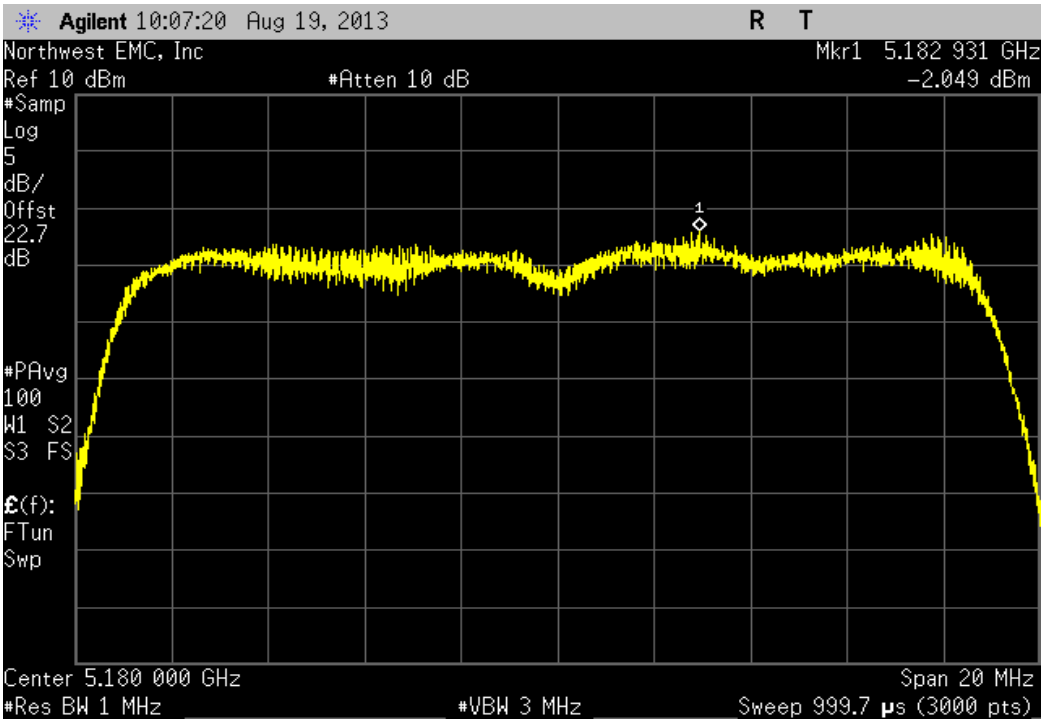


Peak Power Spectral Density - Antenna A-B

Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.467	4	Pass

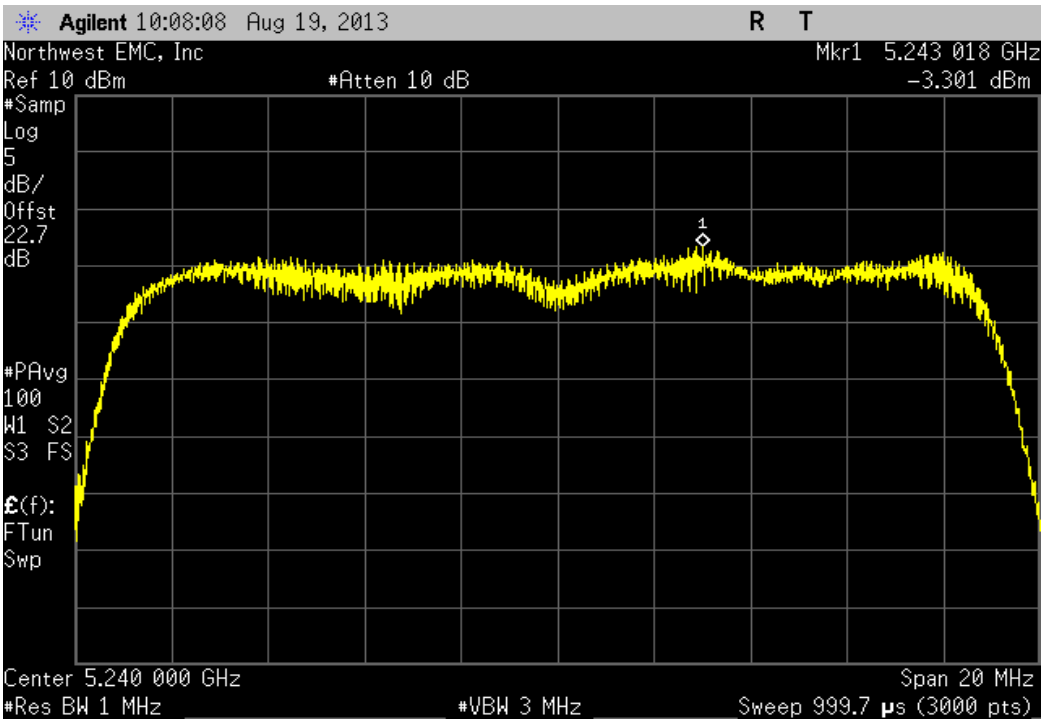


Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.049	4	Pass

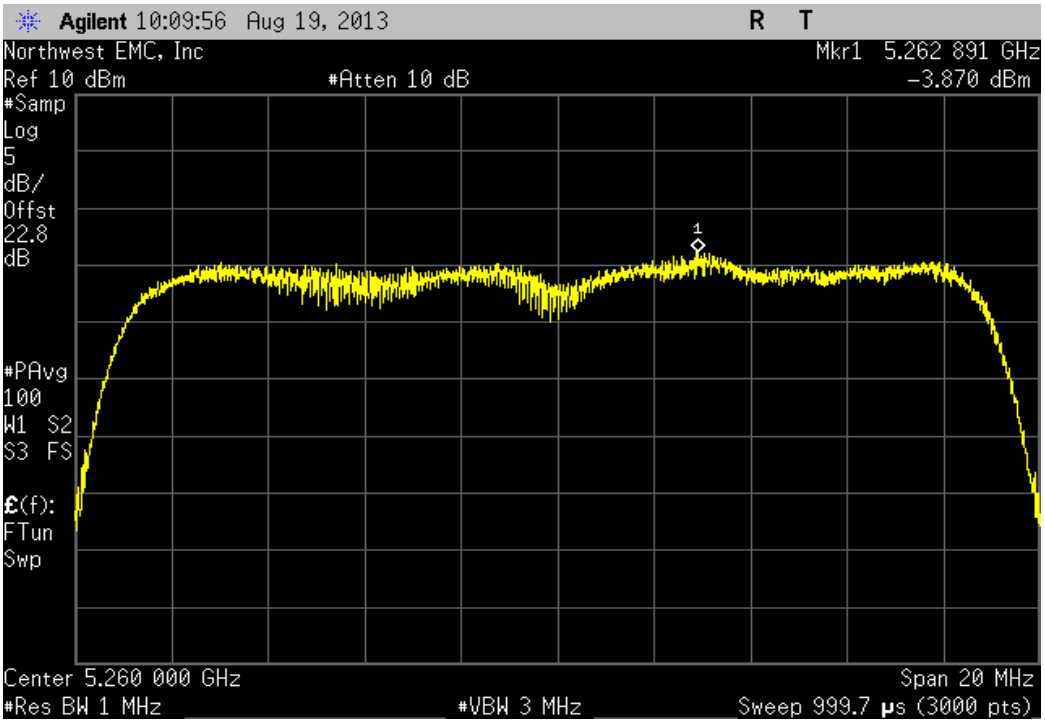


Peak Power Spectral Density - Antenna A-B

Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-3.301	4	Pass

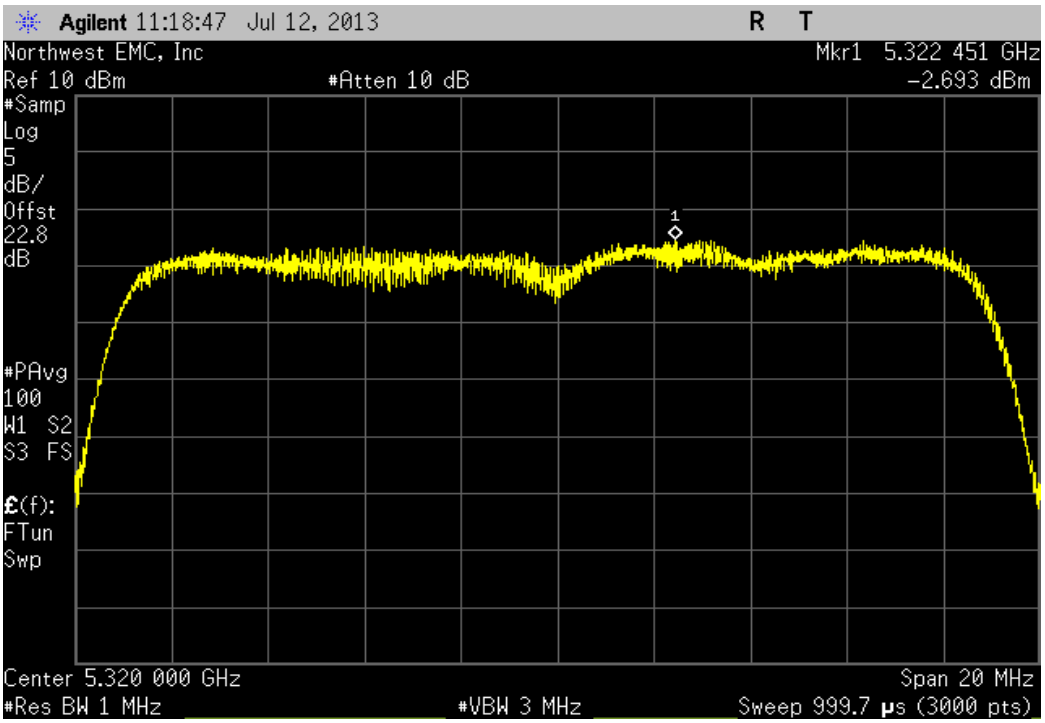


Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-3.87	4	Pass

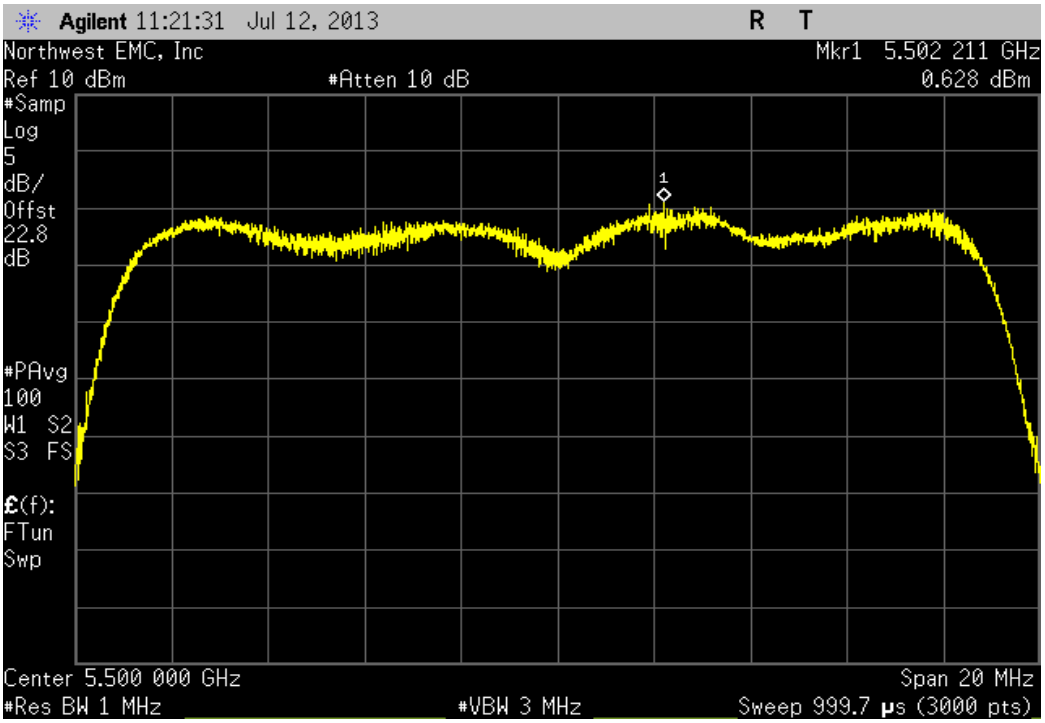


Peak Power Spectral Density - Antenna A-B

Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.693	4	Pass

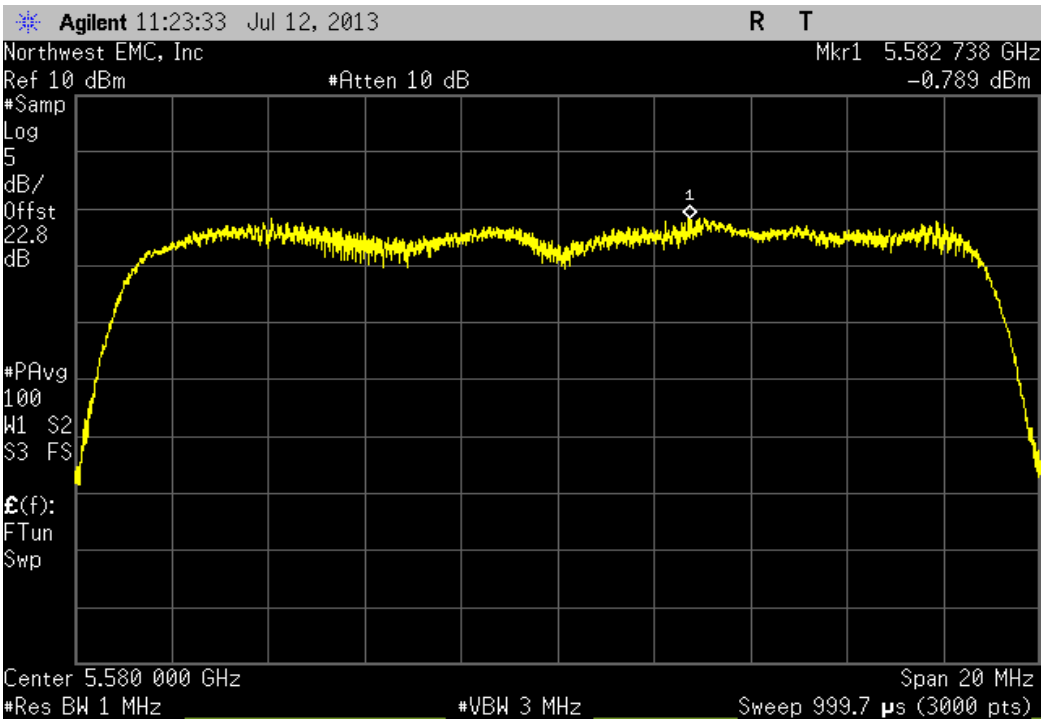


Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				0.628	4	Pass

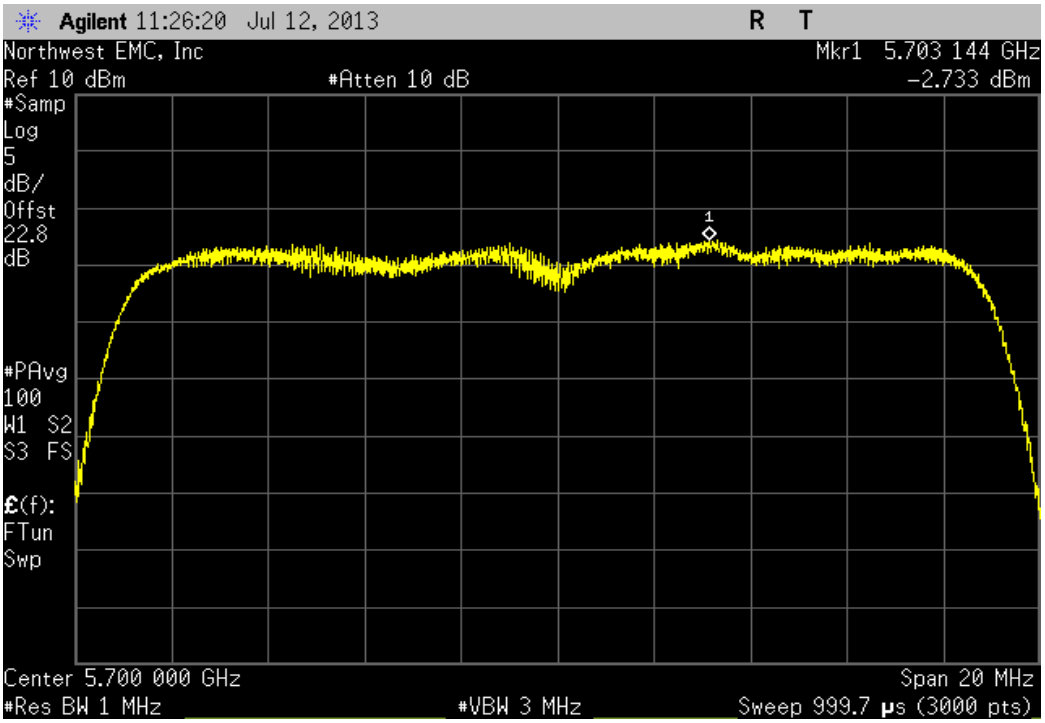


Peak Power Spectral Density - Antenna A-B

Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-0.789	4	Pass

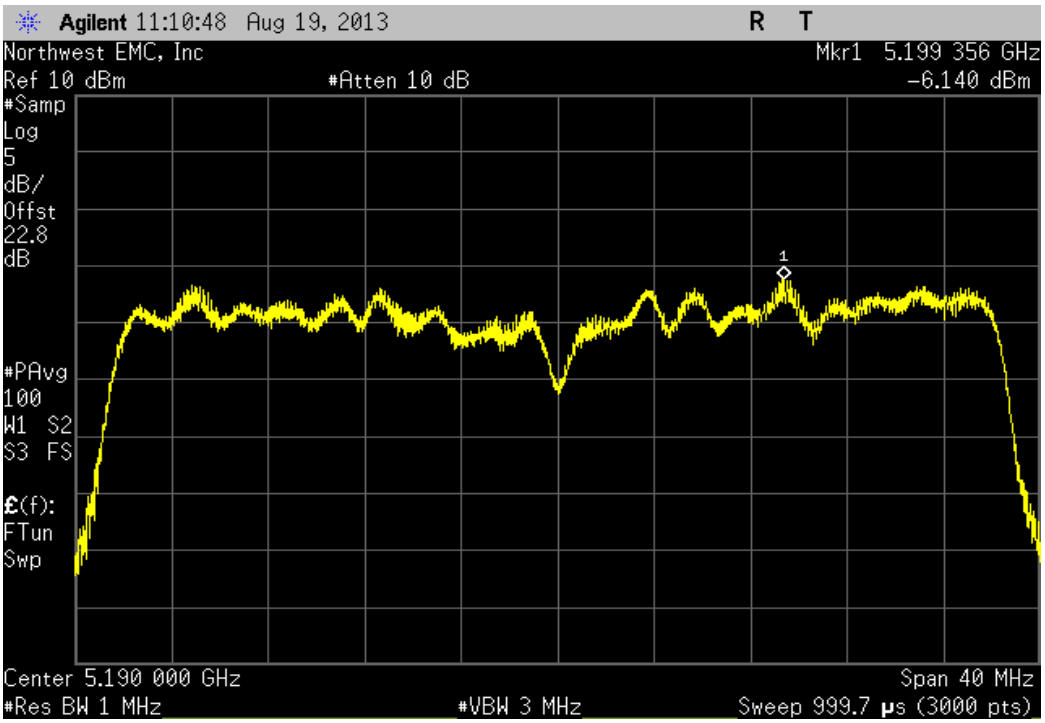


Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.733	4	Pass

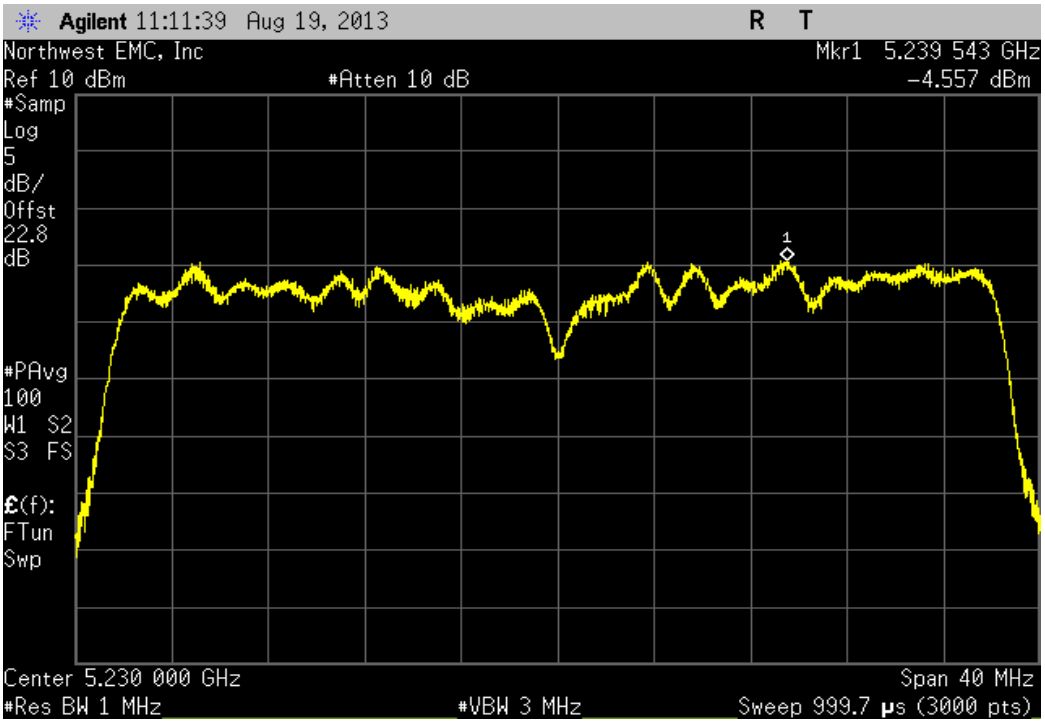


Peak Power Spectral Density - Antenna A-B

Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-6.14	4	Pass

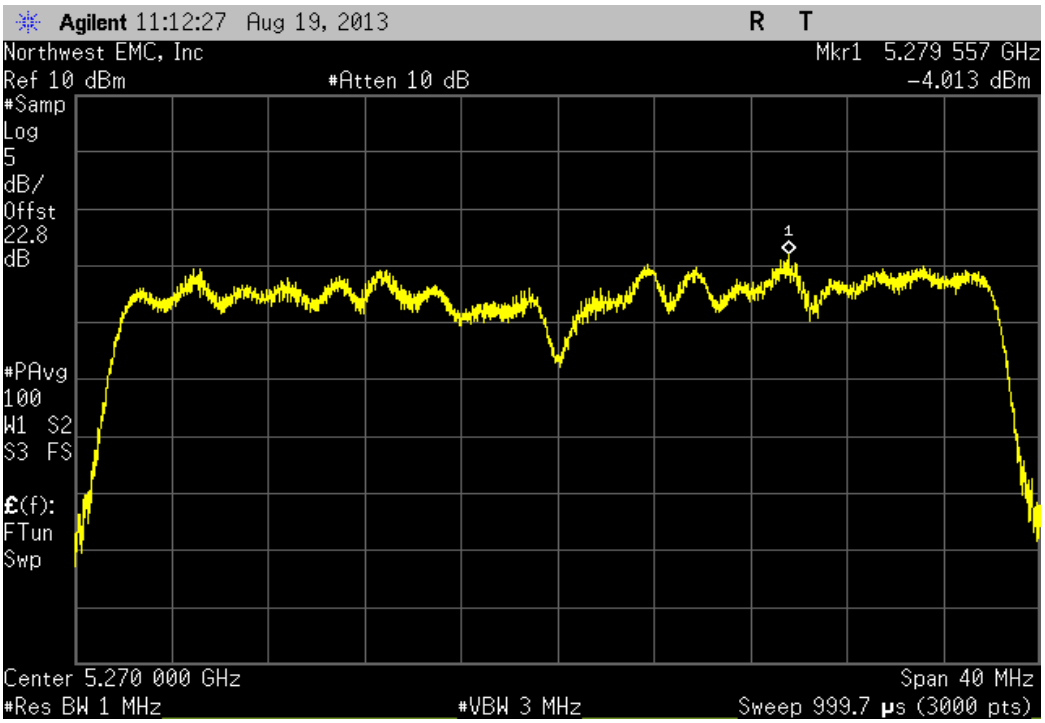


Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-4.557	4	Pass

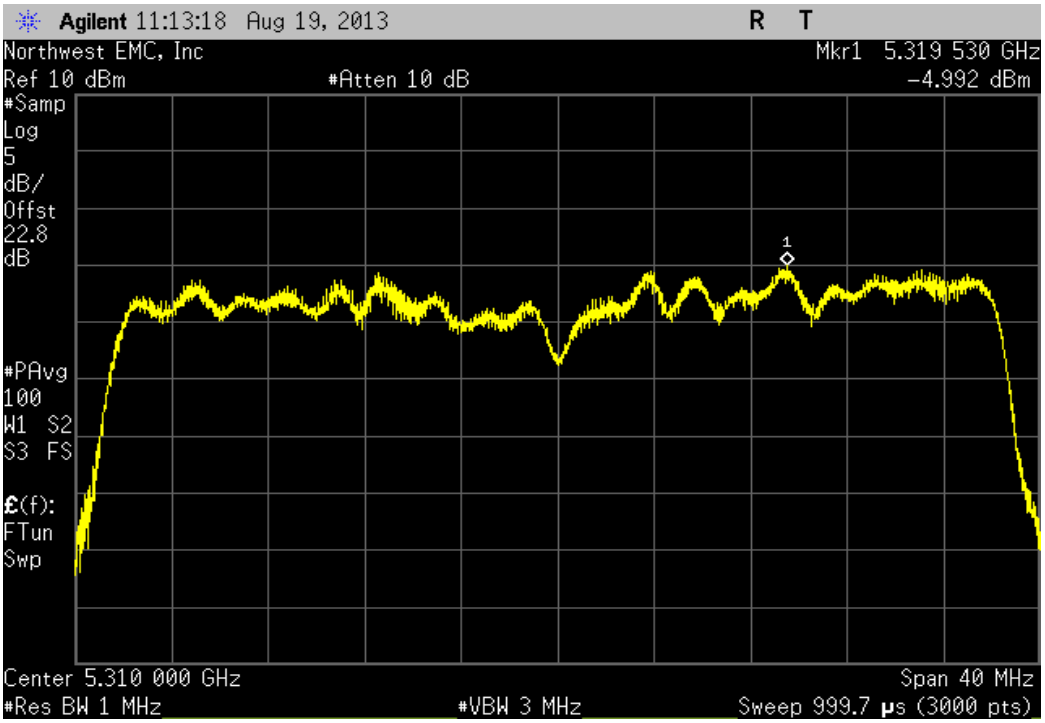


Peak Power Spectral Density - Antenna A-B

Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-4.013	4	Pass

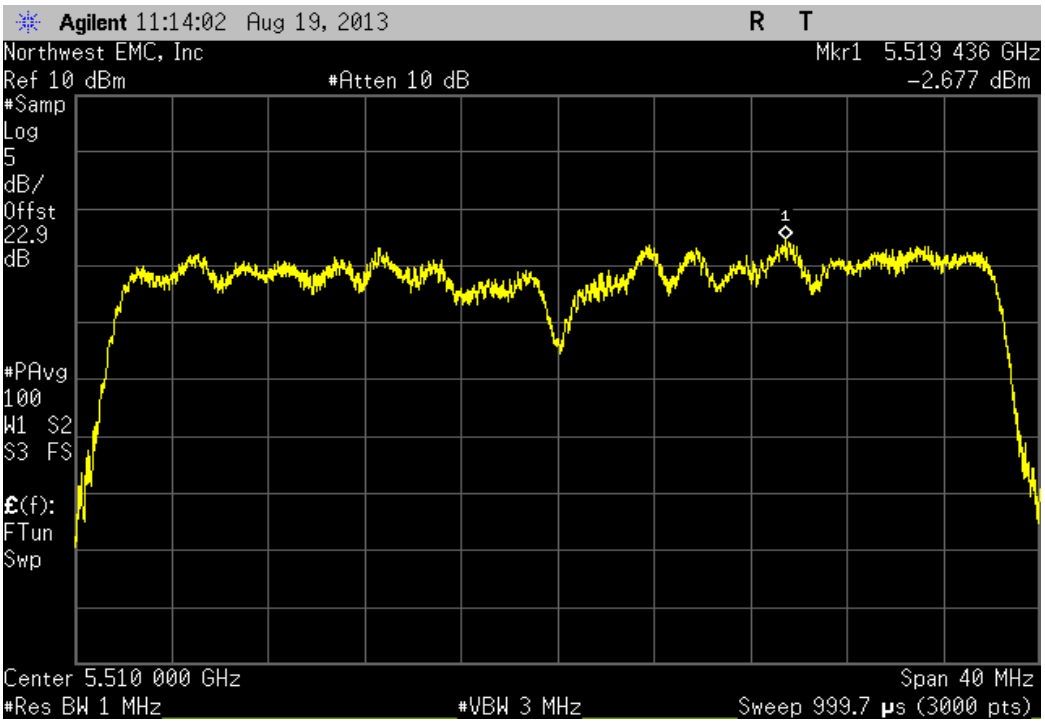


Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-4.992	4	Pass

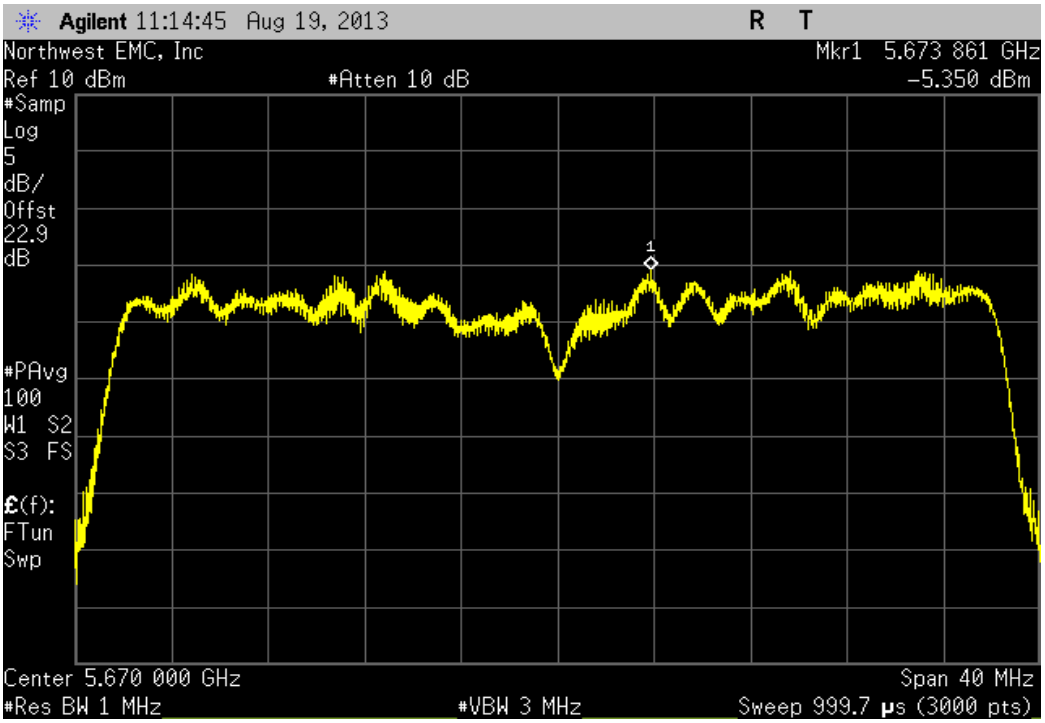


Peak Power Spectral Density - Antenna A-B

Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-2.677	4	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	
				-5.35	4	Pass



Peak Power Spectral Density - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW ≥ 3 MHz
- Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing

Peak Power Spectral Density - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/13/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for GHz channels was added to analyzer reference level offset. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel.

DEVIATIONS FROM TEST STANDARD

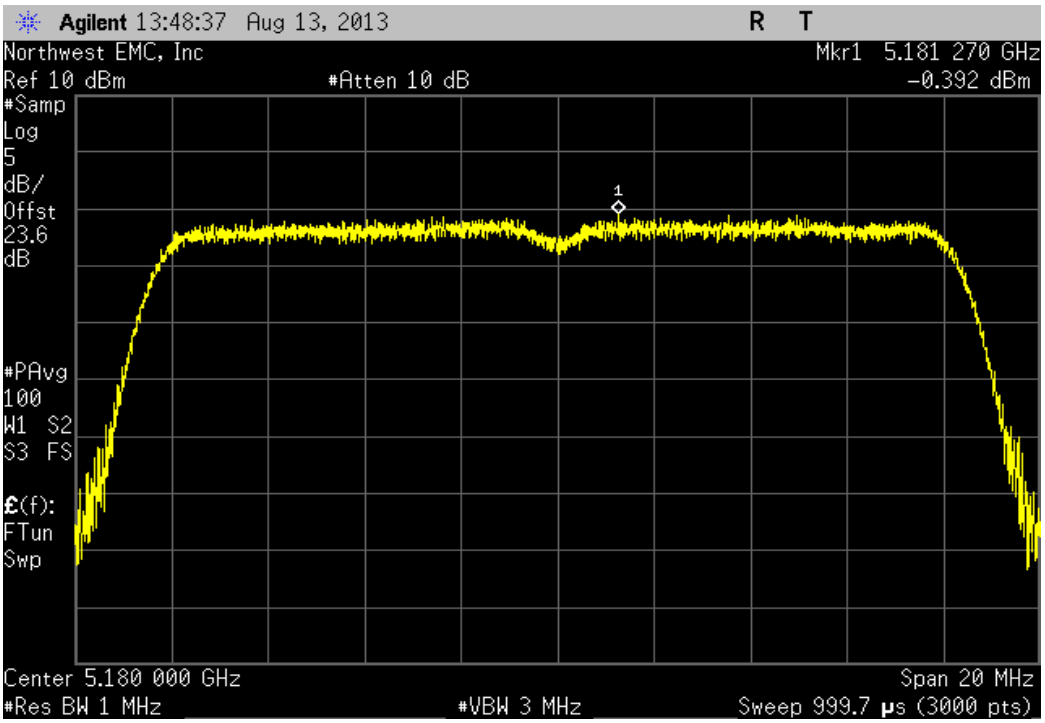
None

Configuration #	1	Signature

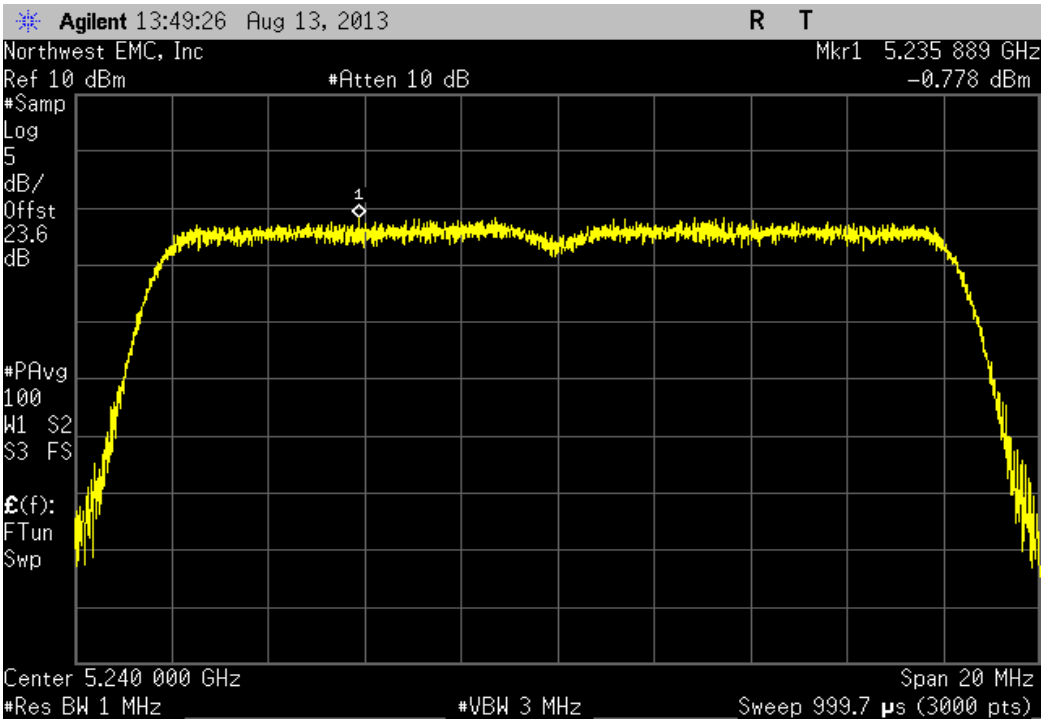
		Value (dBm / MHz)	Limit (dBm / MHz)	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	-0.392	4	Pass
	Ch 48, High Channel 5240 MHz	-0.778	4	Pass
	Ch 52, Low Channel 5260 MHz	-1.398	11	Pass
	Ch 64, High Channel 5320 MHz	-0.812	11	Pass
	Ch 100, Low Channel 5500 MHz	2.58	11	Pass
	Ch 116, Mid Channel 5580 MHz	2.504	11	Pass
	Ch 140, High Channel 5700 MHz	1.589	11	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	-0.404	4	Pass
	Ch 48, High Channel 5240 MHz	-1.083	4	Pass
	Ch 52, Low Channel 5260 MHz	-1.638	11	Pass
	Ch 64, High Channel 5320 MHz	-1.21	11	Pass
	Ch 100, Low Channel 5500 MHz	2.368	11	Pass
	Ch 116, Mid Channel 5580 MHz	2.456	11	Pass
	Ch 140, High Channel 5700 MHz	1.219	11	Pass
40 MHz				
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	-3.692	4	Pass
	Ch 44/48, High Channel 5230 MHz	-1.415	4	Pass
	Ch 52/56, Low Channel 5270 MHz	-2.46	11	Pass
	Ch 60/64, High Channel 5310 MHz	-3.483	11	Pass
	Ch 100/104, Low Channel 5510 MHz	-0.563	11	Pass
	Ch 132/136, High Channel 5670 MHz	-1.544	11	Pass

Peak Power Spectral Density - Antenna A

20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.392	4	Pass

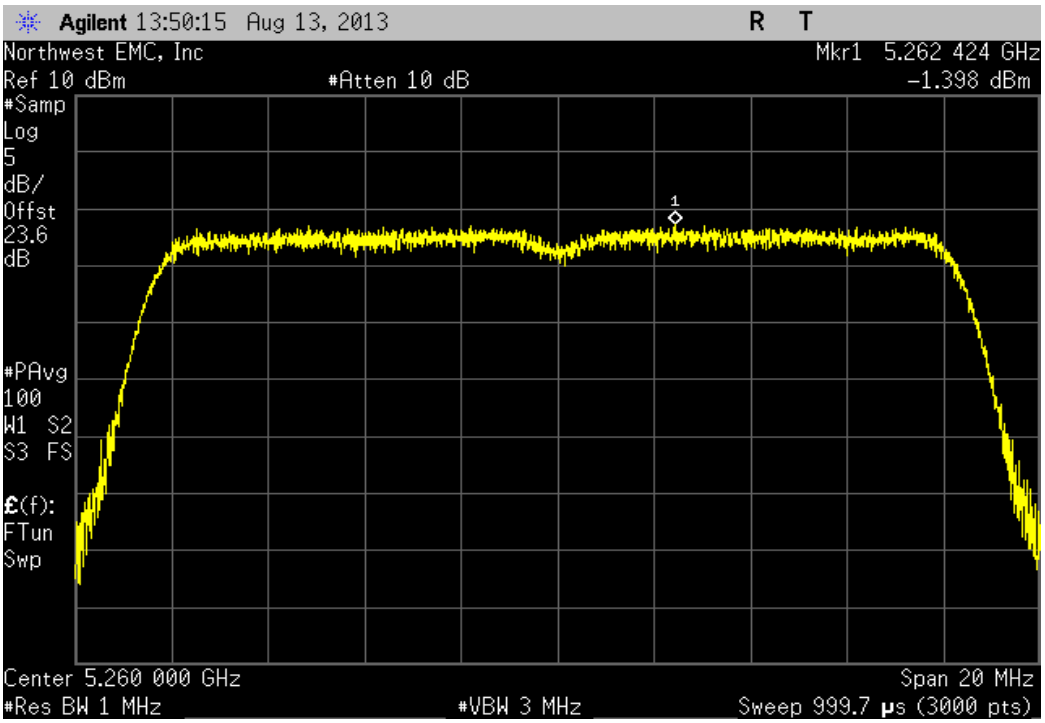


20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.778	4	Pass

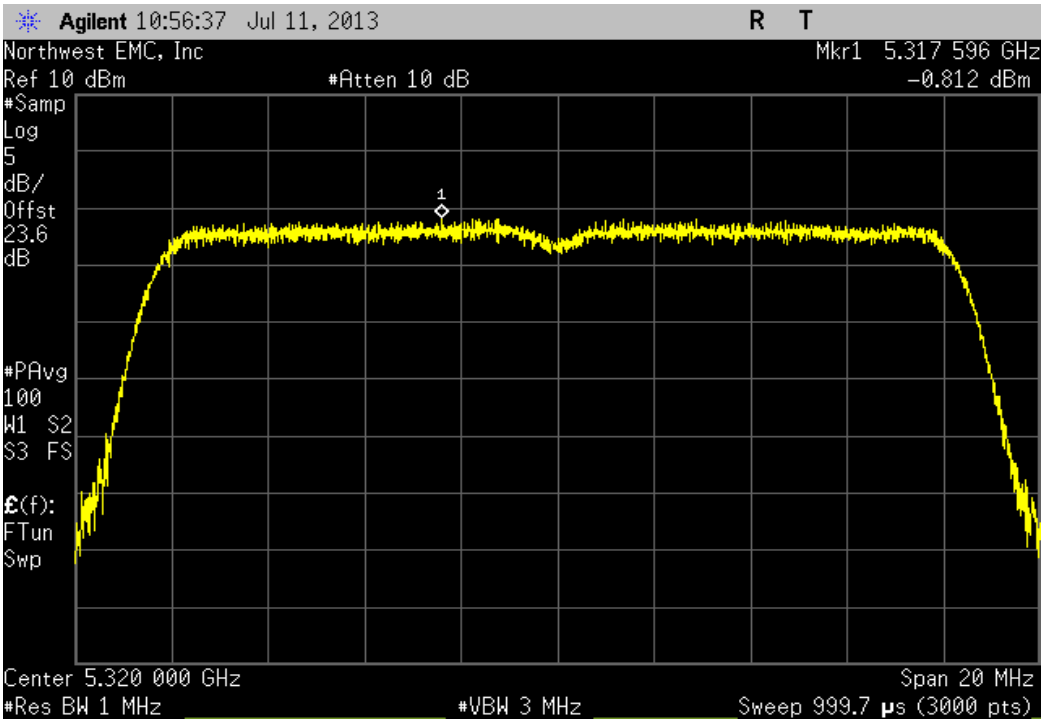


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.398	11	Pass

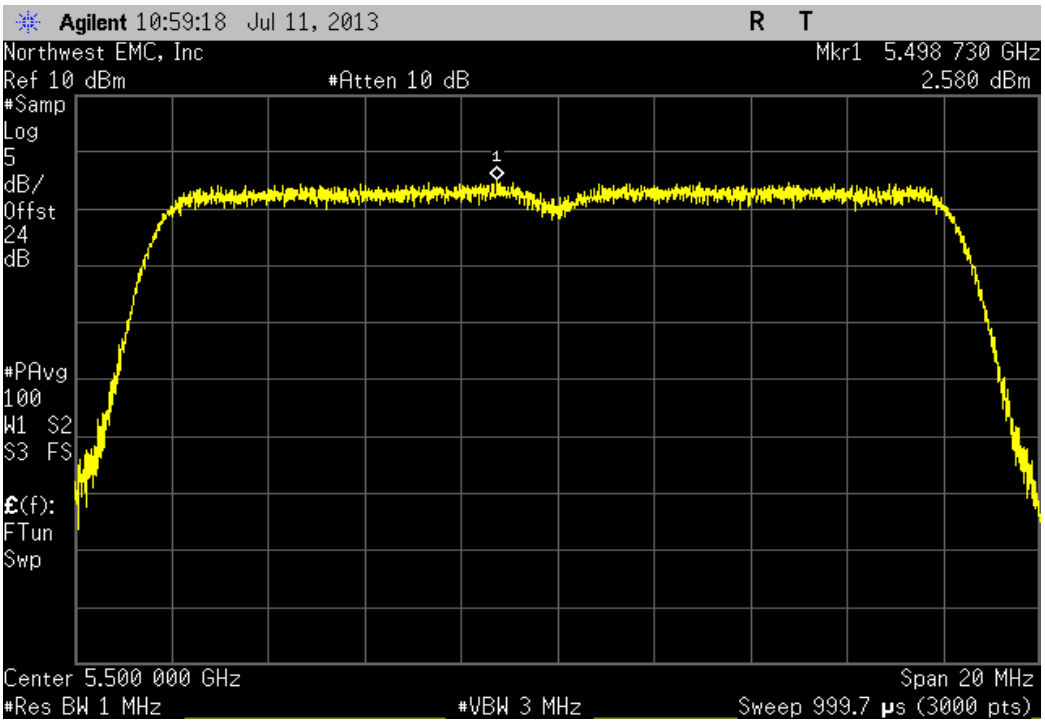


20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.812	11	Pass

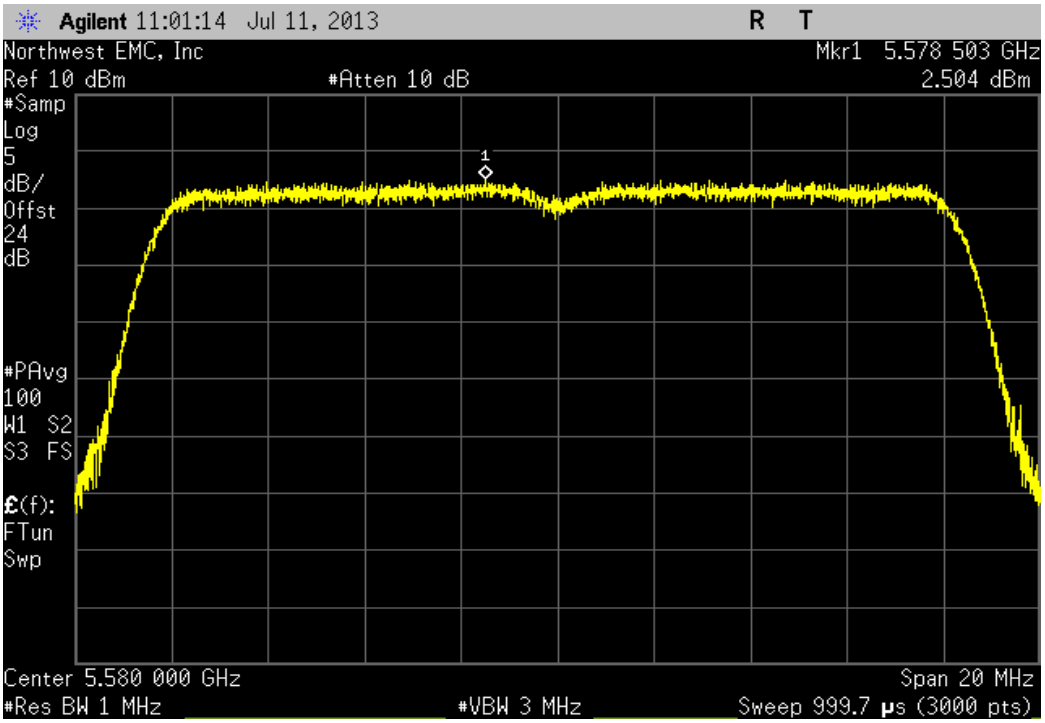


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				2.58	11	Pass

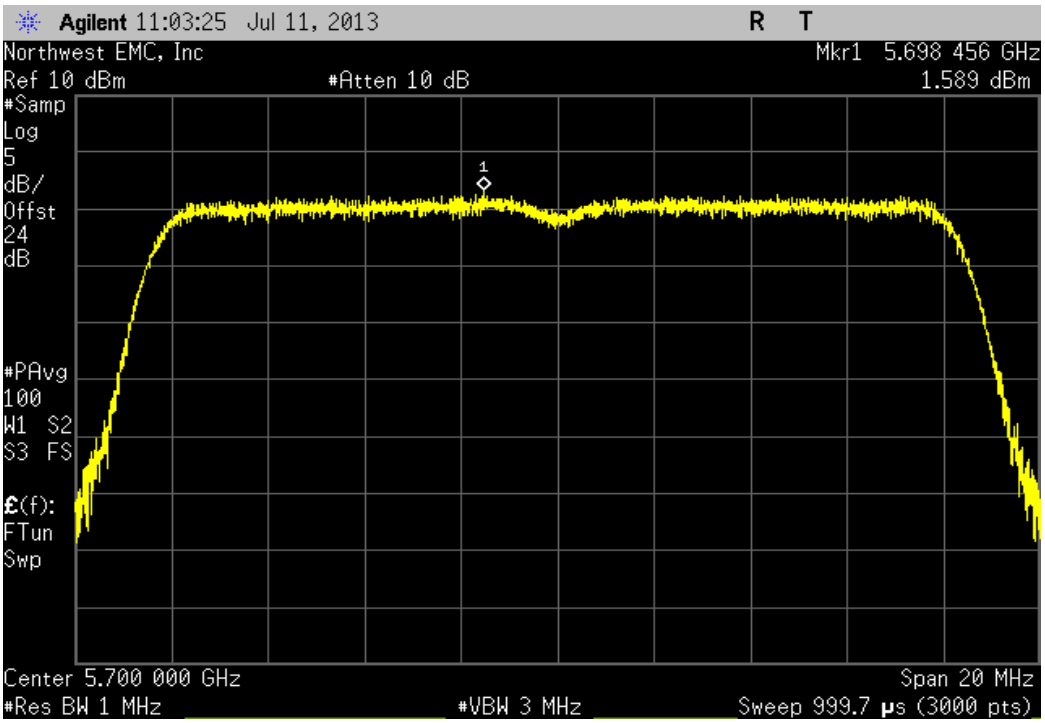


20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				2.504	11	Pass

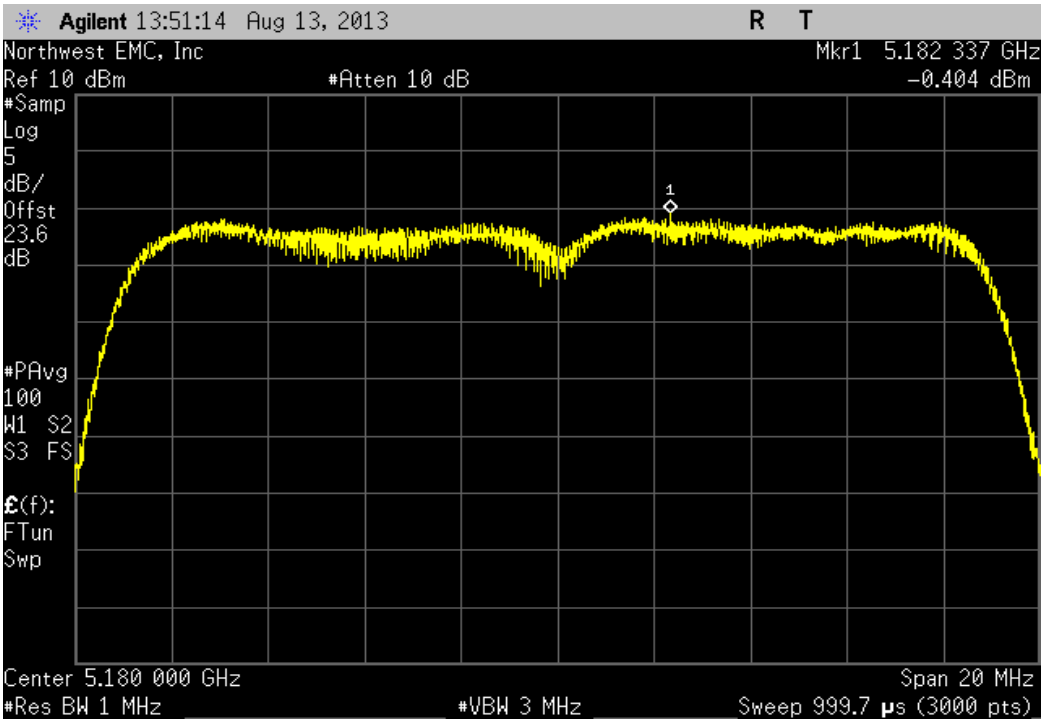


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				1.589	11	Pass

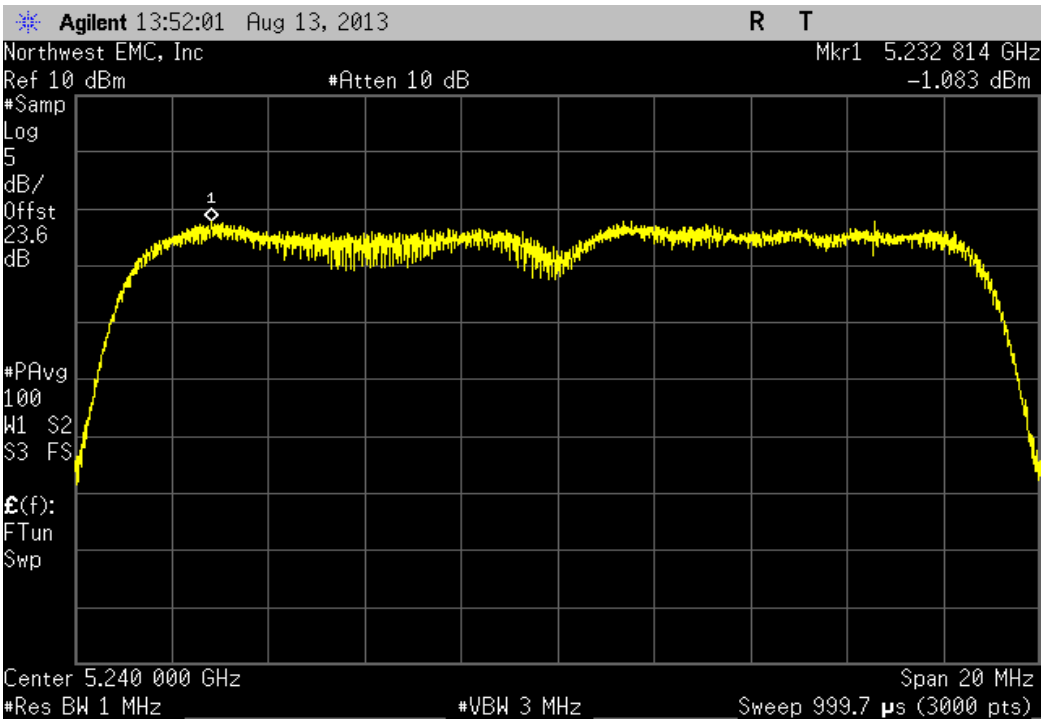


20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.404	4	Pass

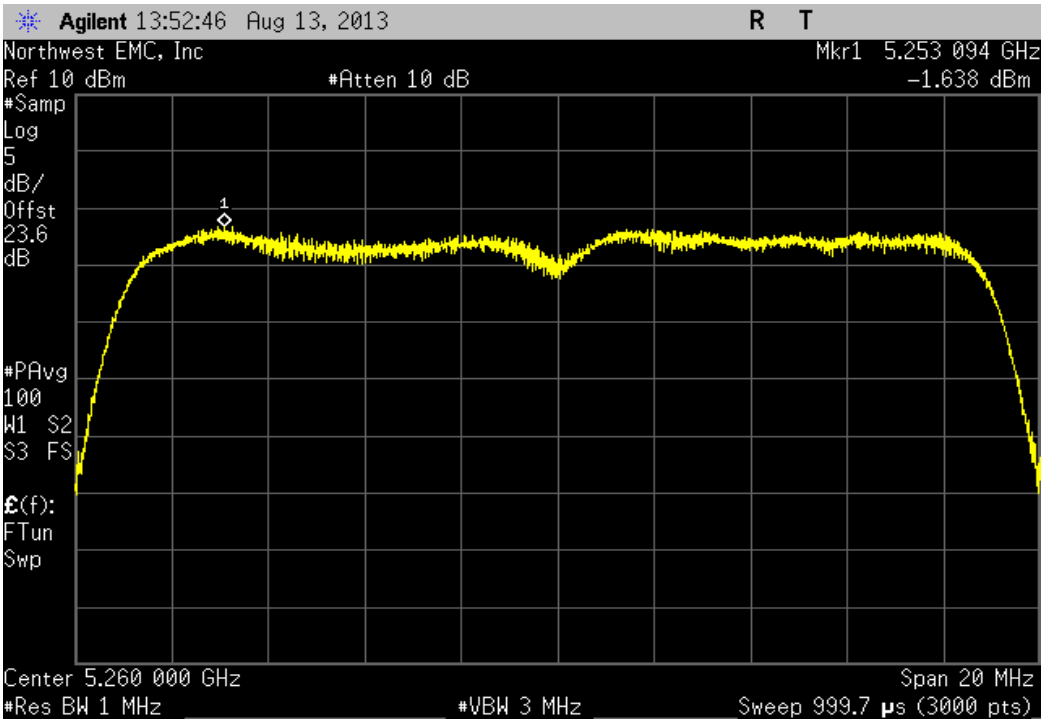


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.083	4	Pass

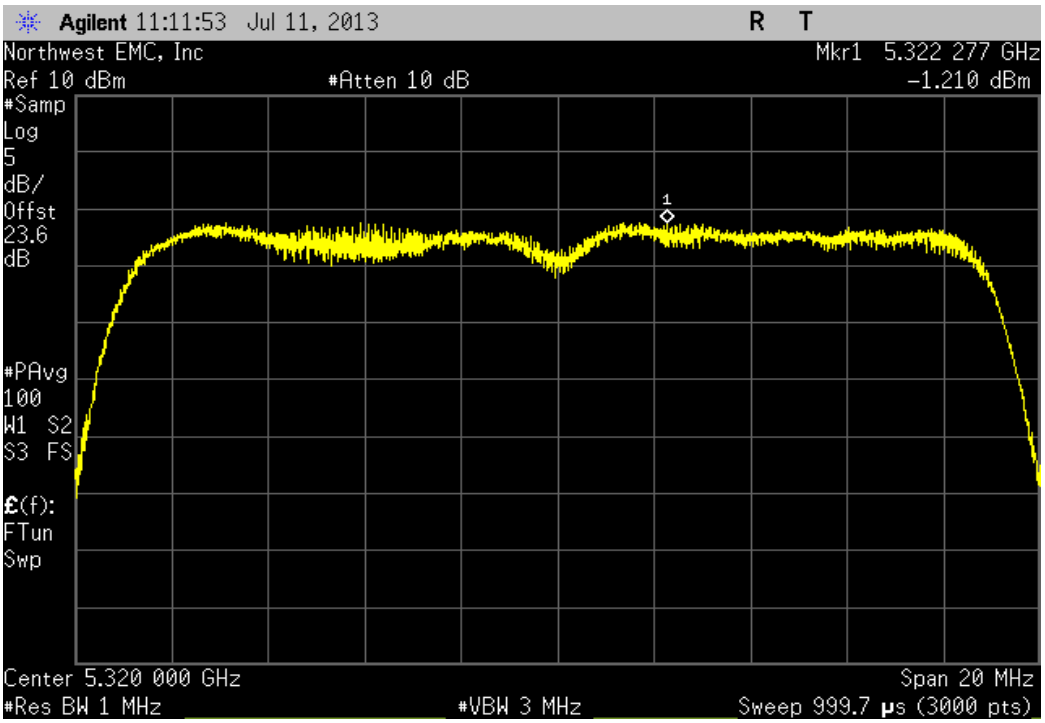


20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.638	11	Pass

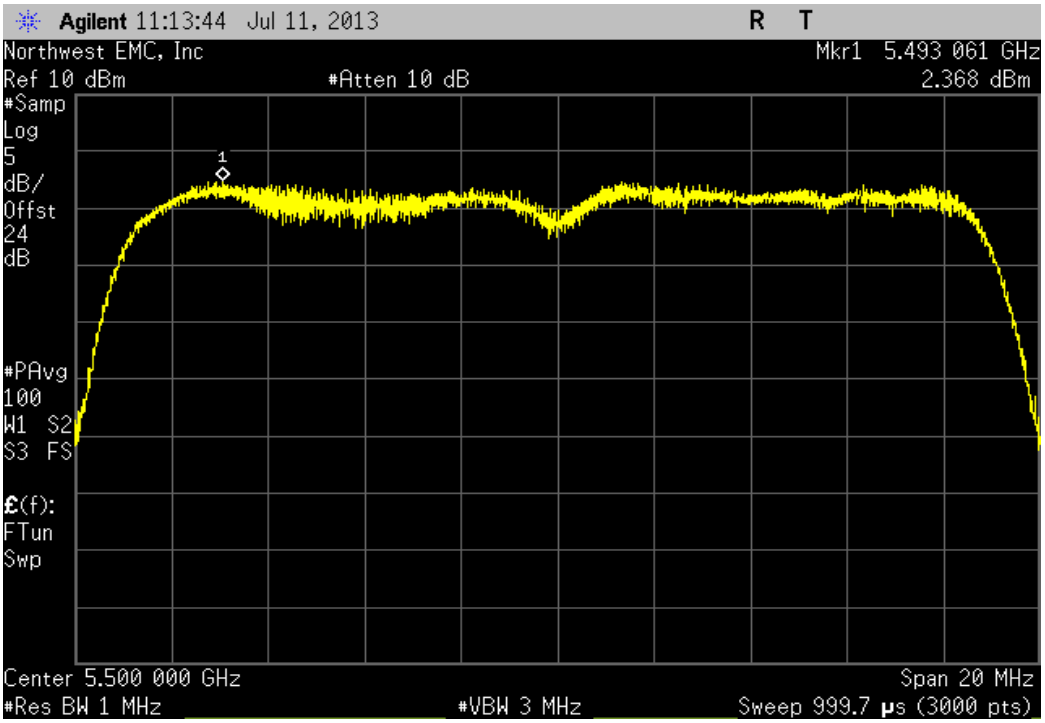


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.21	11	Pass

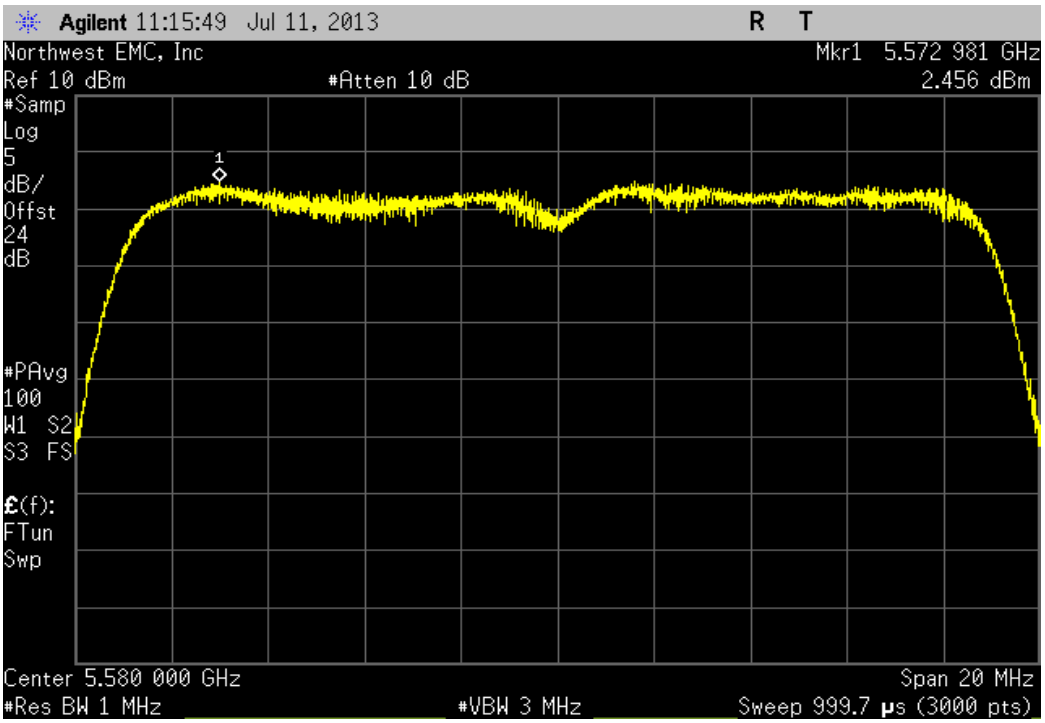


20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				2.368	11	Pass

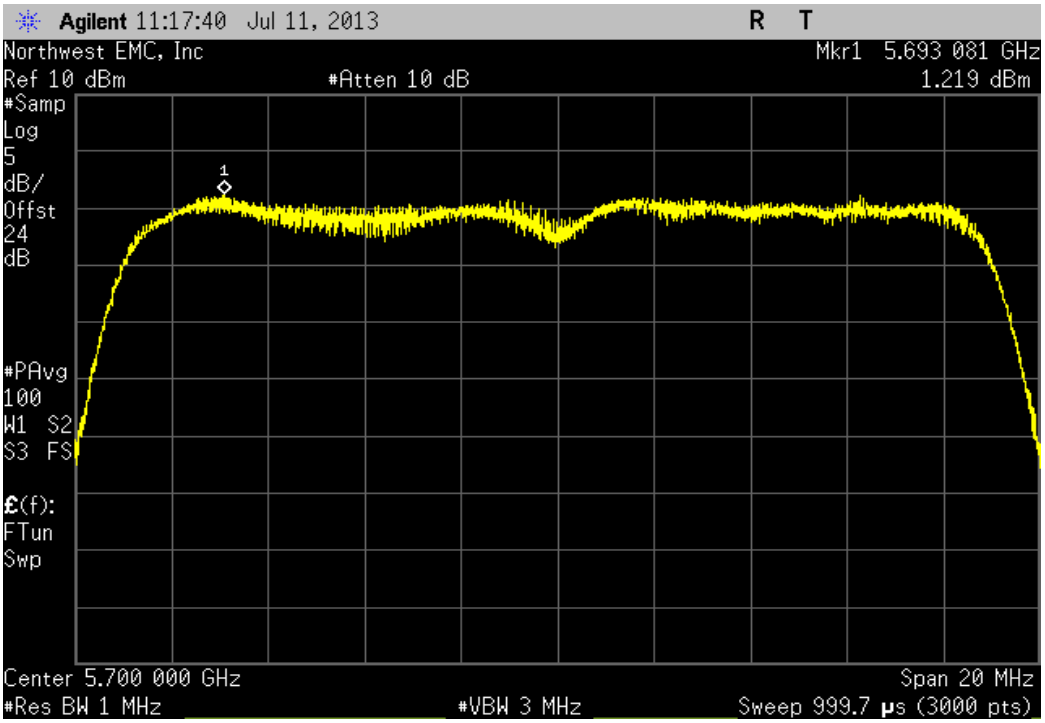


Peak Power Spectral Density - Antenna A

20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				2.456	11	Pass

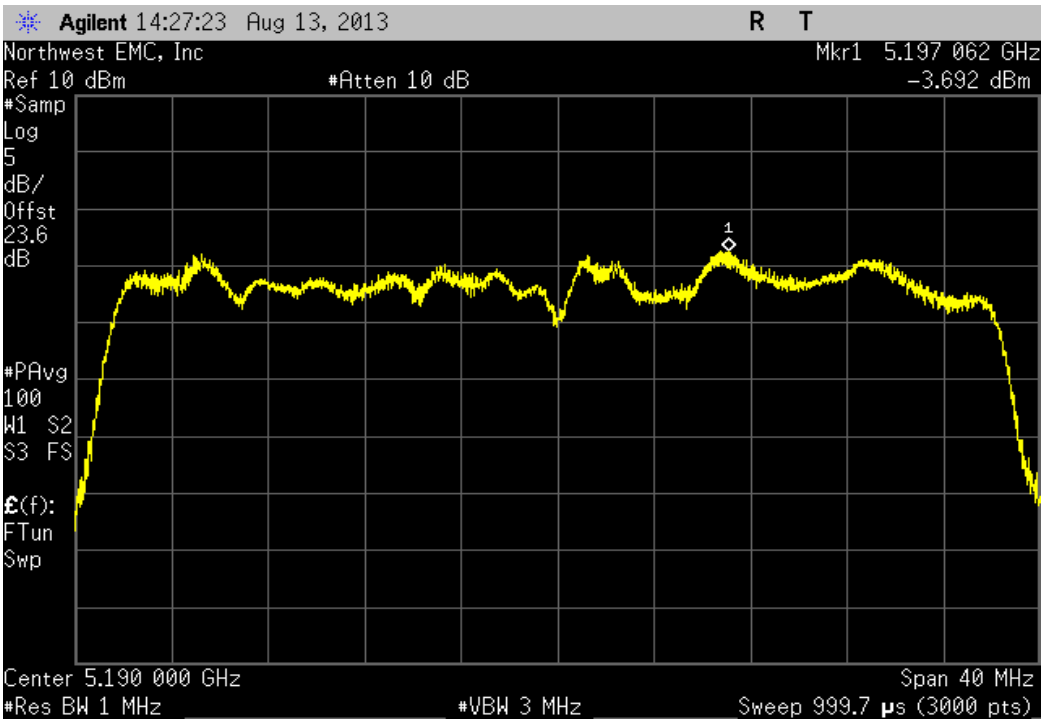


20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				1.219	11	Pass

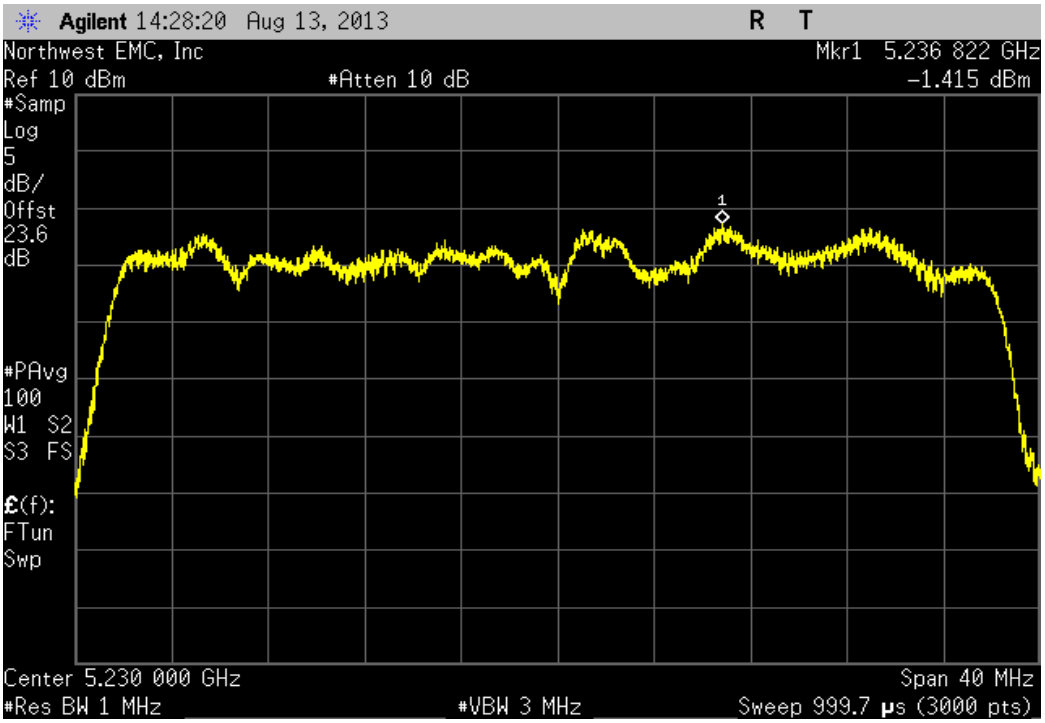


Peak Power Spectral Density - Antenna A

40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-3.692	4	Pass

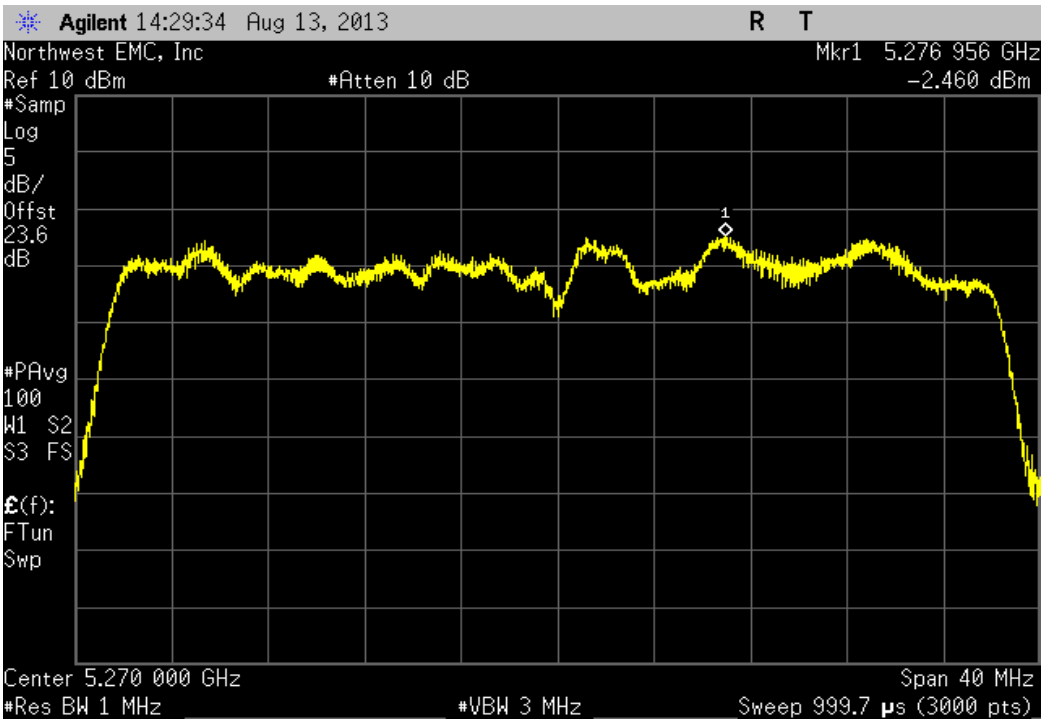


40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.415	4	Pass

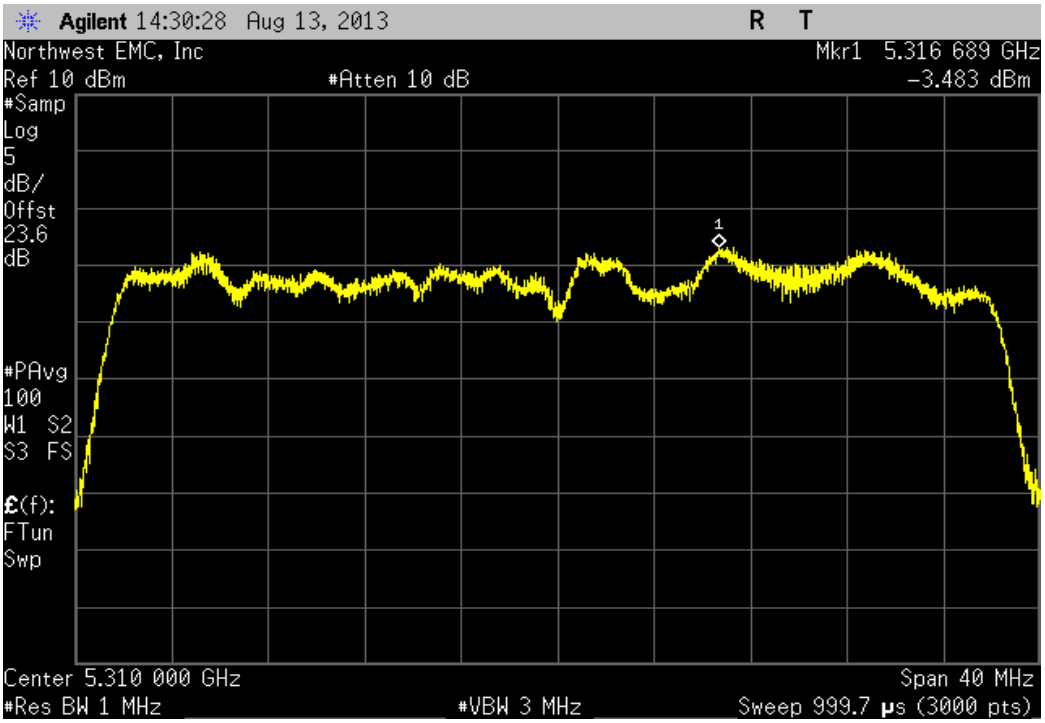


Peak Power Spectral Density - Antenna A

40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.46	11	Pass

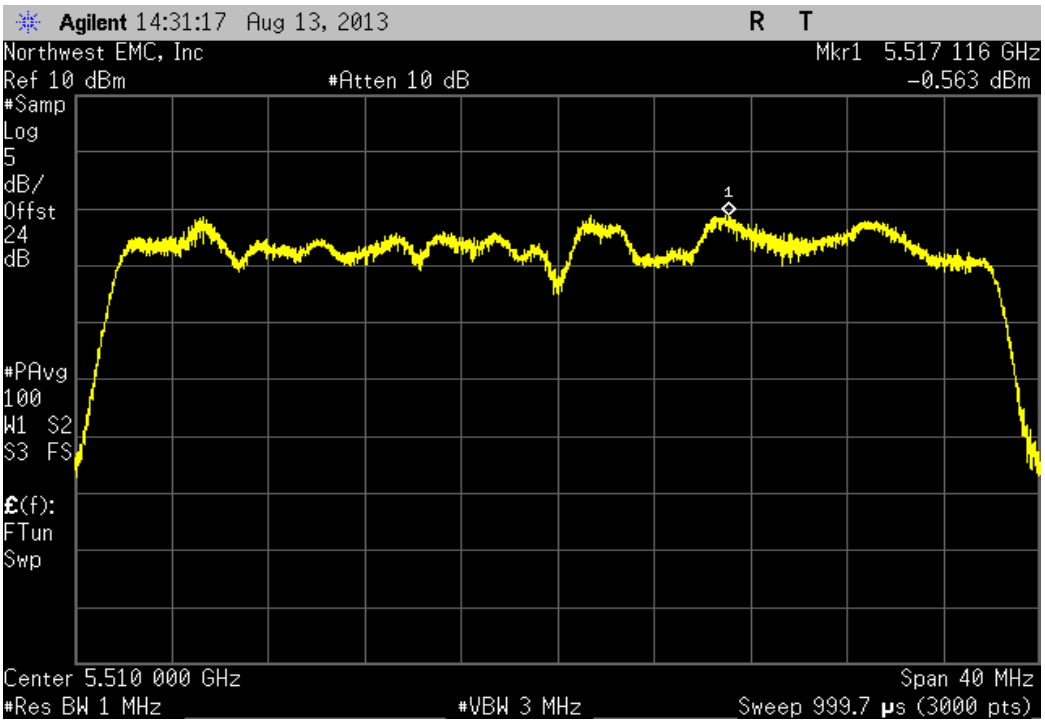


40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-3.483	11	Pass

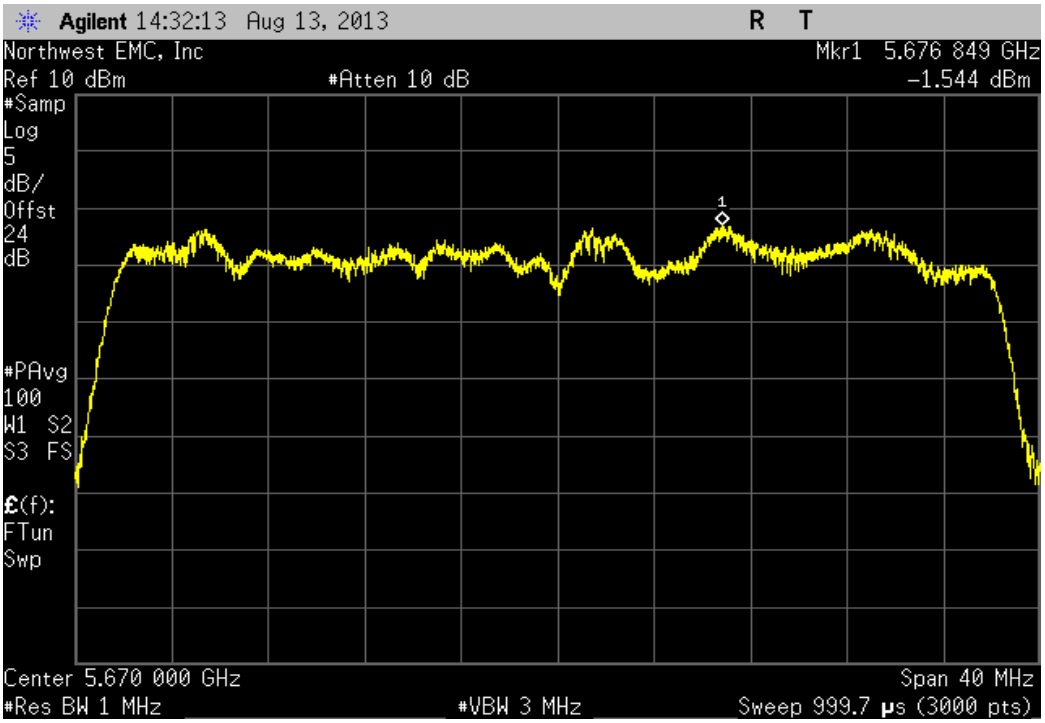


Peak Power Spectral Density - Antenna A

40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.563	11	Pass



40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.544	11	Pass



Peak Power Spectral Density - Antenna B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Analog Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

- The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.
- RBW = 1 MHz, VBW ≥ 3 MHz
- Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.
- Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

DC Block was used in-line for measurements made while under test. Please see the power table section of this test report. It documents the power settings used in the manufacturer's software during testing.

Peak Power Spectral Density - Antenna B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	08/19/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	50%
Project:	None	Barometric Pres.:	1020mb
Tested by:	Richard Mellroth, Brandon Hobbs	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel.

DEVIATIONS FROM TEST STANDARD

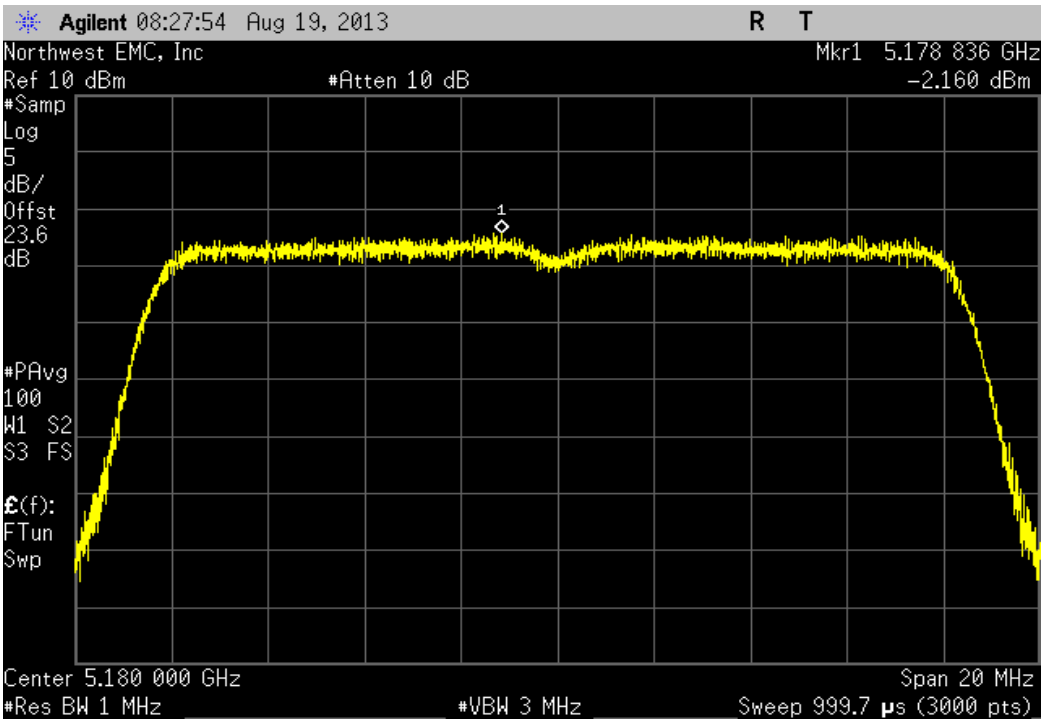
None

Configuration #	1	Signature

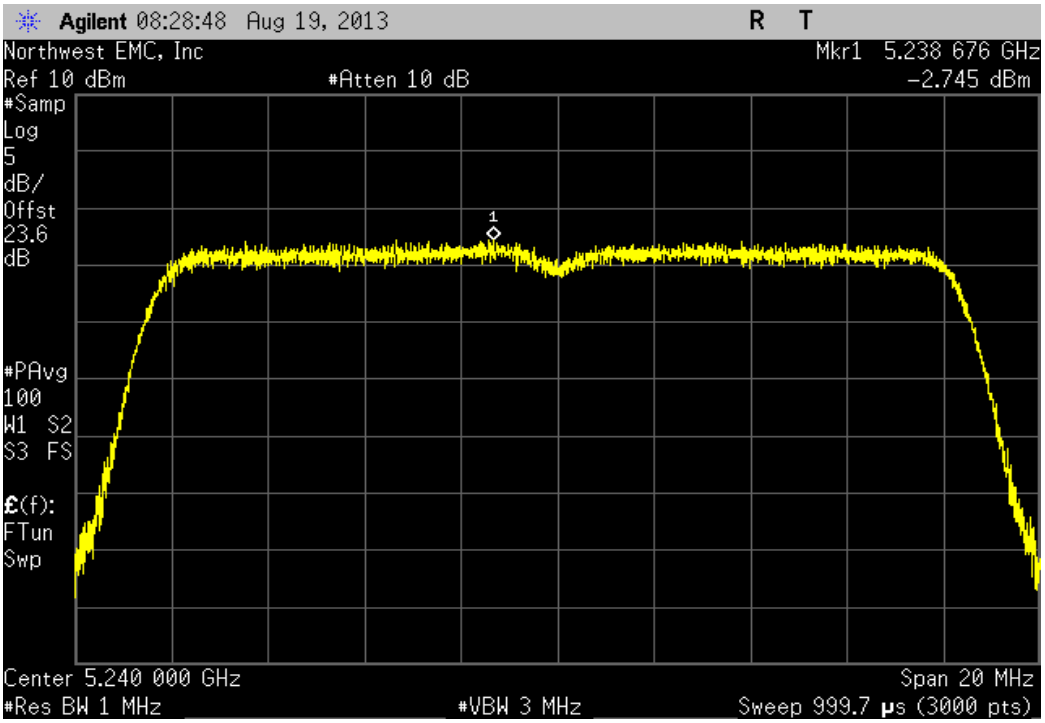
		Value (dBm / MHz)	Limit (dBm / MHz)	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	-2.16	4	Pass
	Ch 48, High Channel 5240 MHz	-2.745	4	Pass
	Ch 52, Low Channel 5260 MHz	-2.997	11	Pass
	Ch 64, High Channel 5320 MHz	-1.941	11	Pass
	Ch 100, Low Channel 5500 MHz	1.223	11	Pass
	Ch 116, Mid Channel 5580 MHz	0.975	11	Pass
	Ch 140, High Channel 5700 MHz	-0.869	11	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	-1.559	4	Pass
	Ch 48, High Channel 5240 MHz	-2.149	4	Pass
	Ch 52, Low Channel 5260 MHz	-2.616	11	Pass
	Ch 64, High Channel 5320 MHz	-2.429	11	Pass
	Ch 100, Low Channel 5500 MHz	1.207	11	Pass
	Ch 116, Mid Channel 5580 MHz	1.037	11	Pass
	Ch 140, High Channel 5700 MHz	-0.949	11	Pass
40 MHz				
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	-5.024	4	Pass
	Ch 44/48, High Channel 5230 MHz	-2.929	4	Pass
	Ch 52/56, Low Channel 5270 MHz	-3.374	11	Pass
	Ch 60/64, High Channel 5310 MHz	-4.222	11	Pass
	Ch 100/104, Low Channel 5510 MHz	-1.261	11	Pass
	Ch 132/136, High Channel 5670 MHz	-3.359	11	Pass

Peak Power Spectral Density - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.16	4	Pass

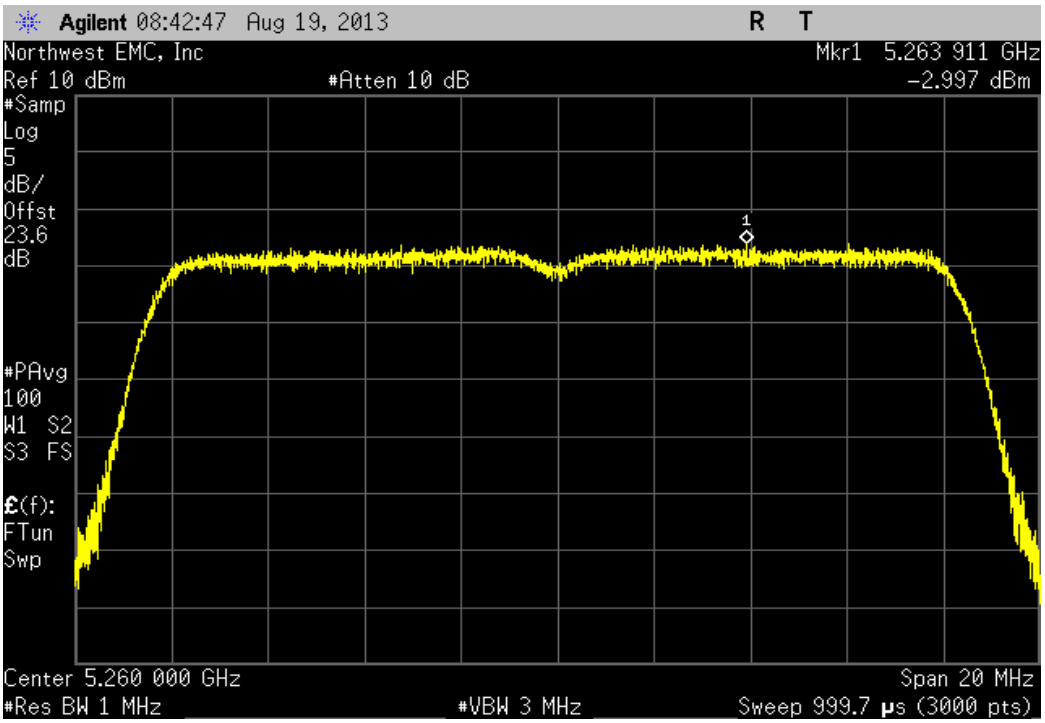


20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.745	4	Pass

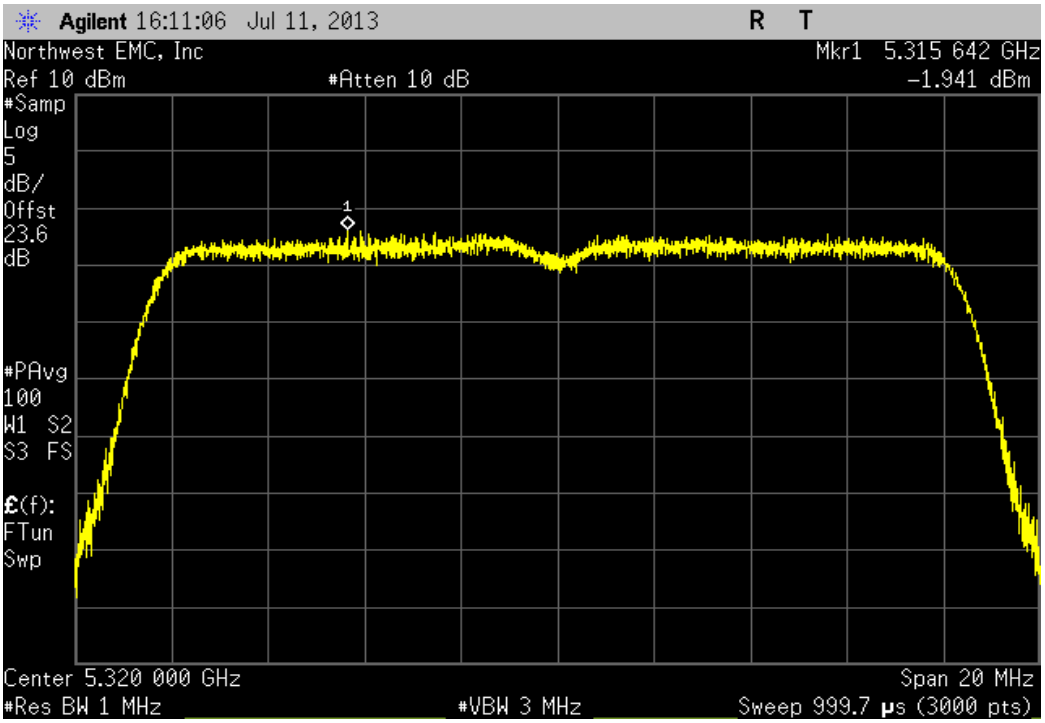


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.997	11	Pass

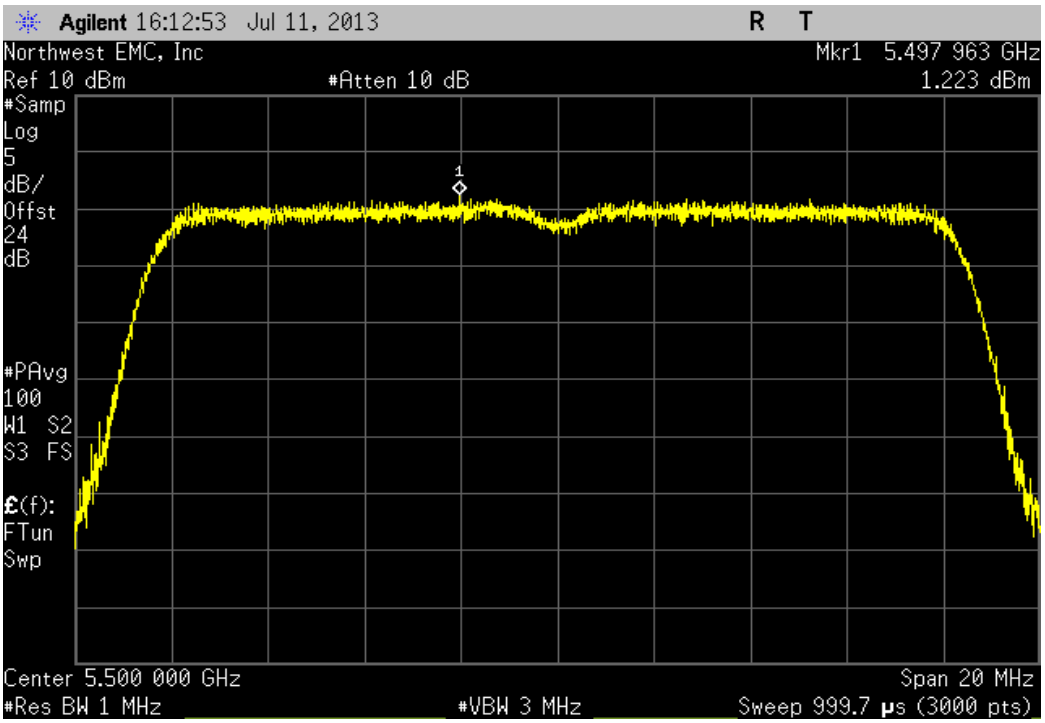


20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.941	11	Pass

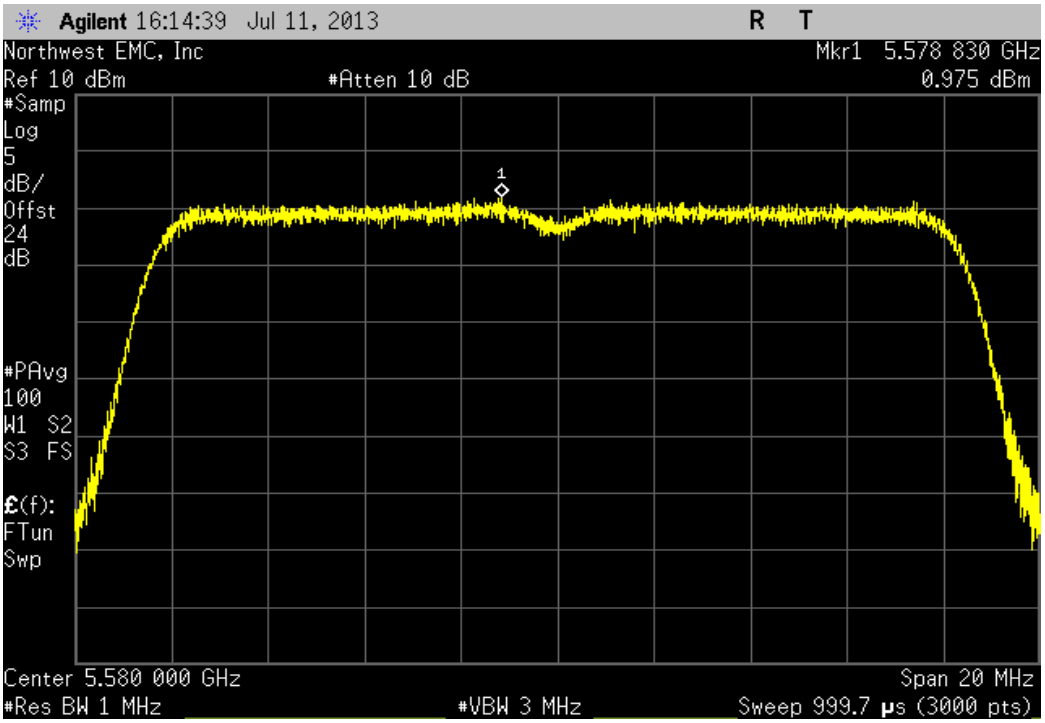


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				1.223	11	Pass

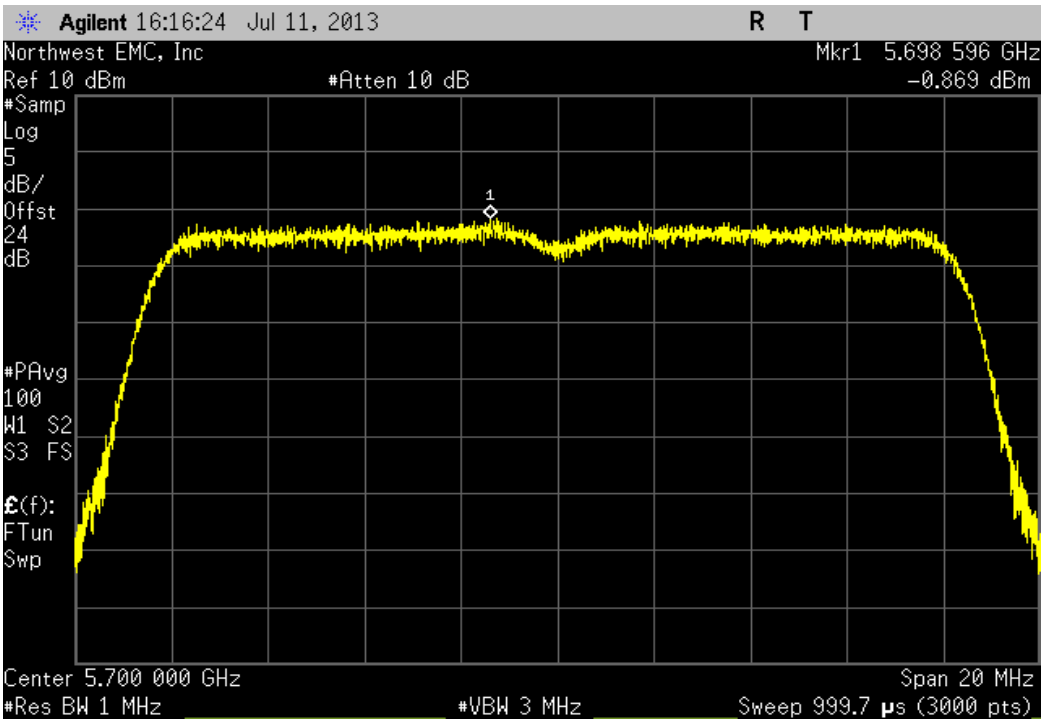


20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				0.975	11	Pass

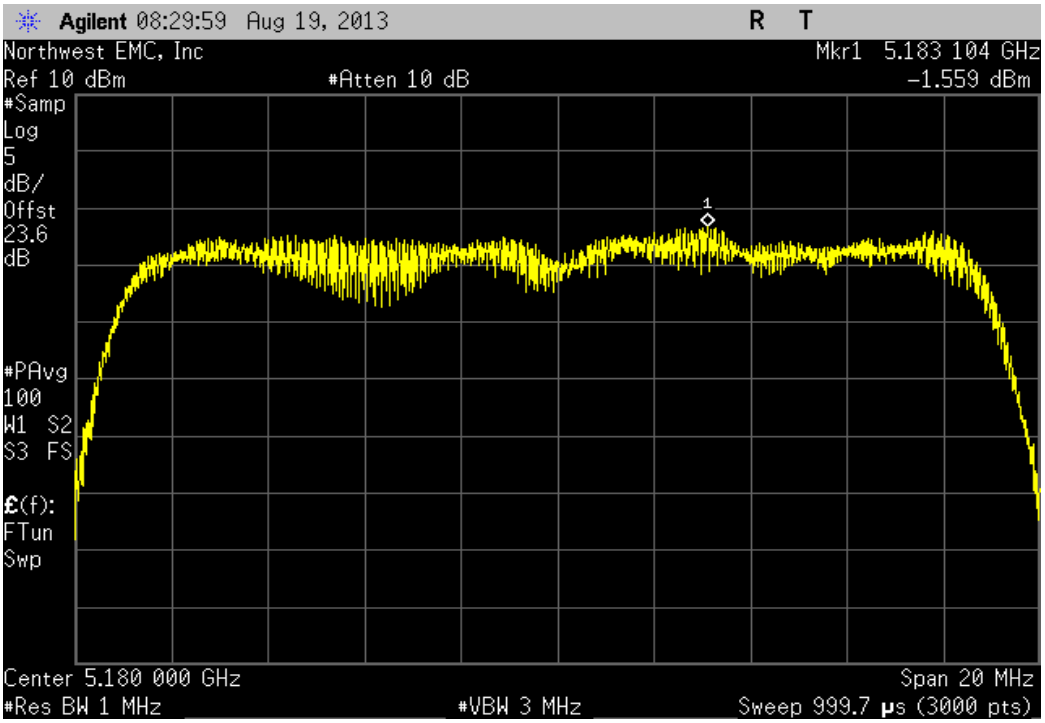


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.869	11	Pass

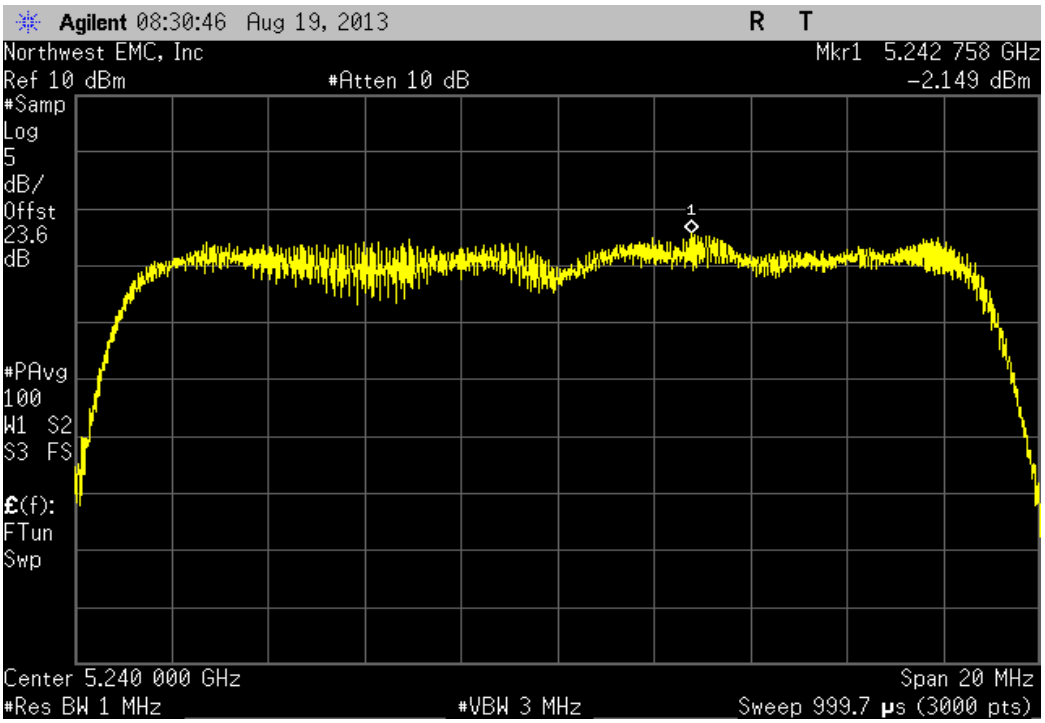


20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.559	4	Pass

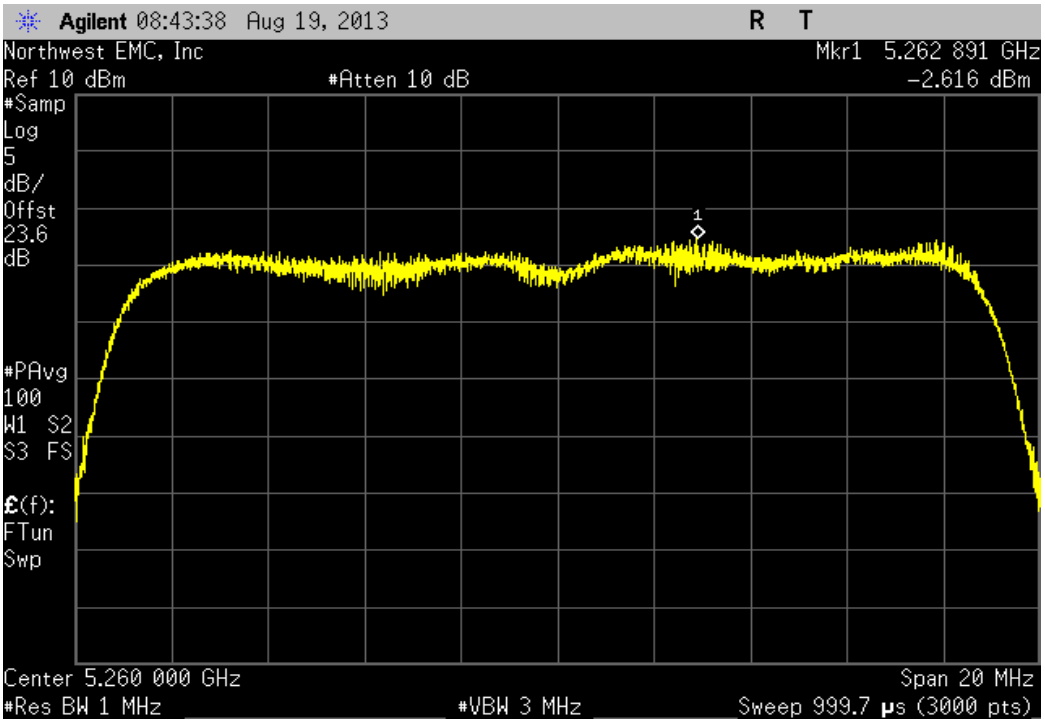


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.149	4	Pass

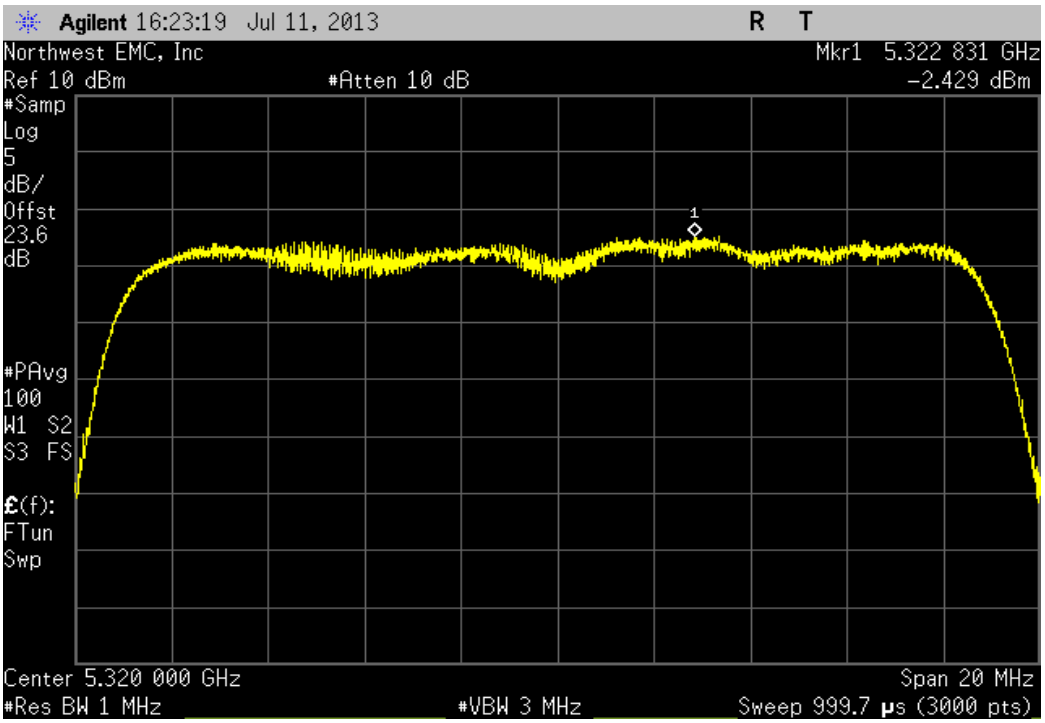


20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.616	11	Pass

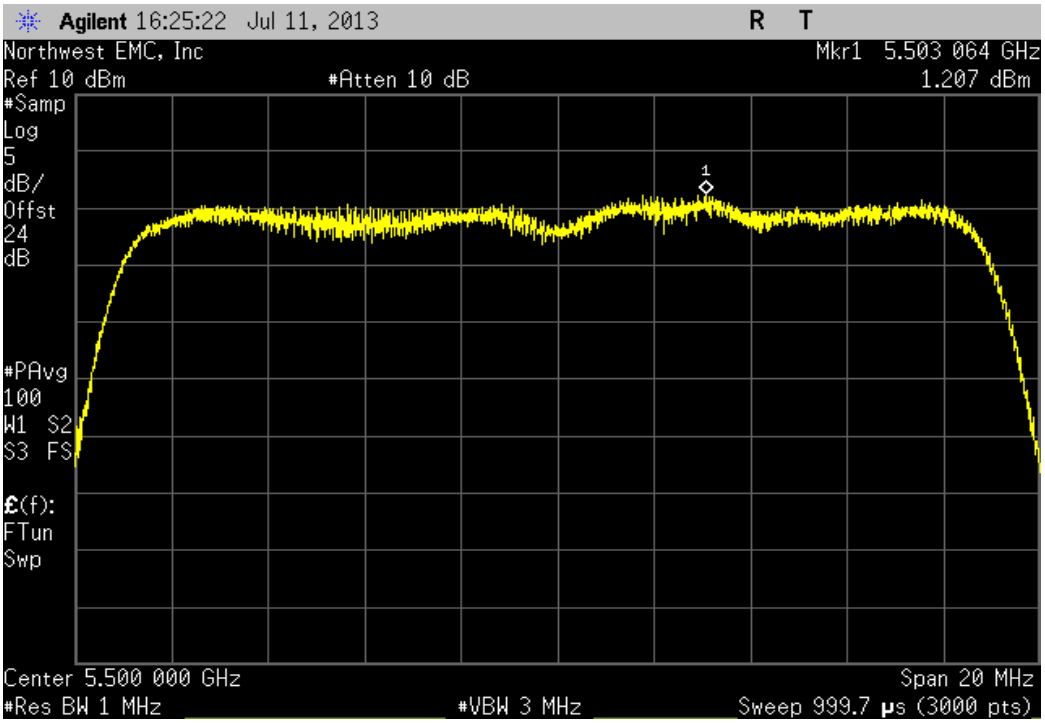


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.429	11	Pass

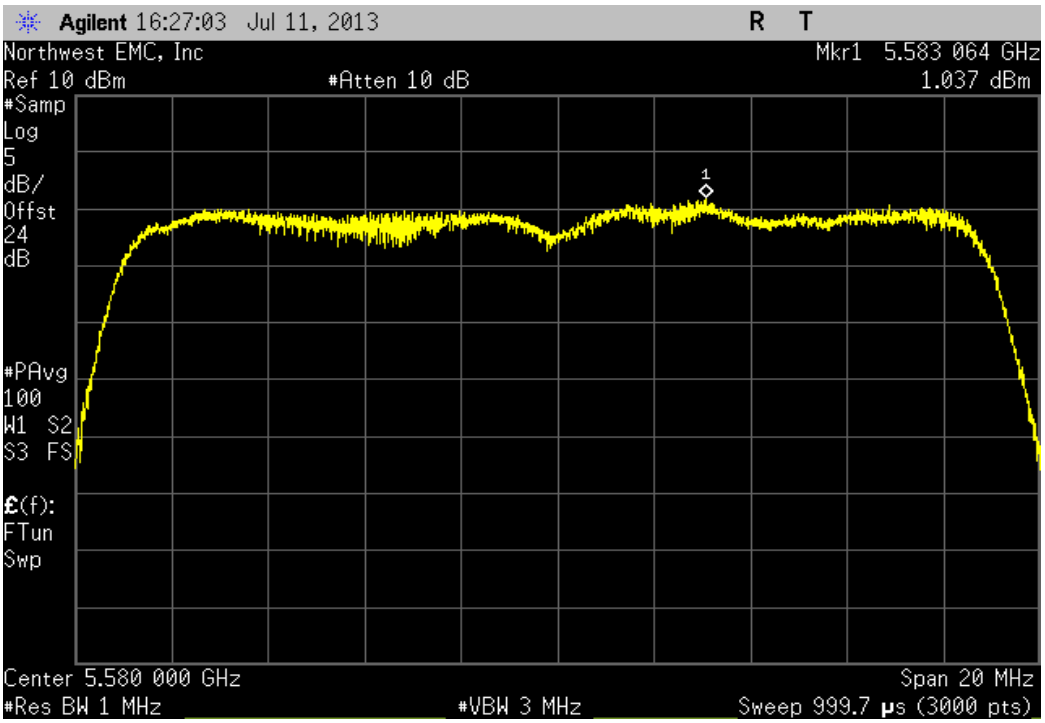


20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				1.207	11	Pass

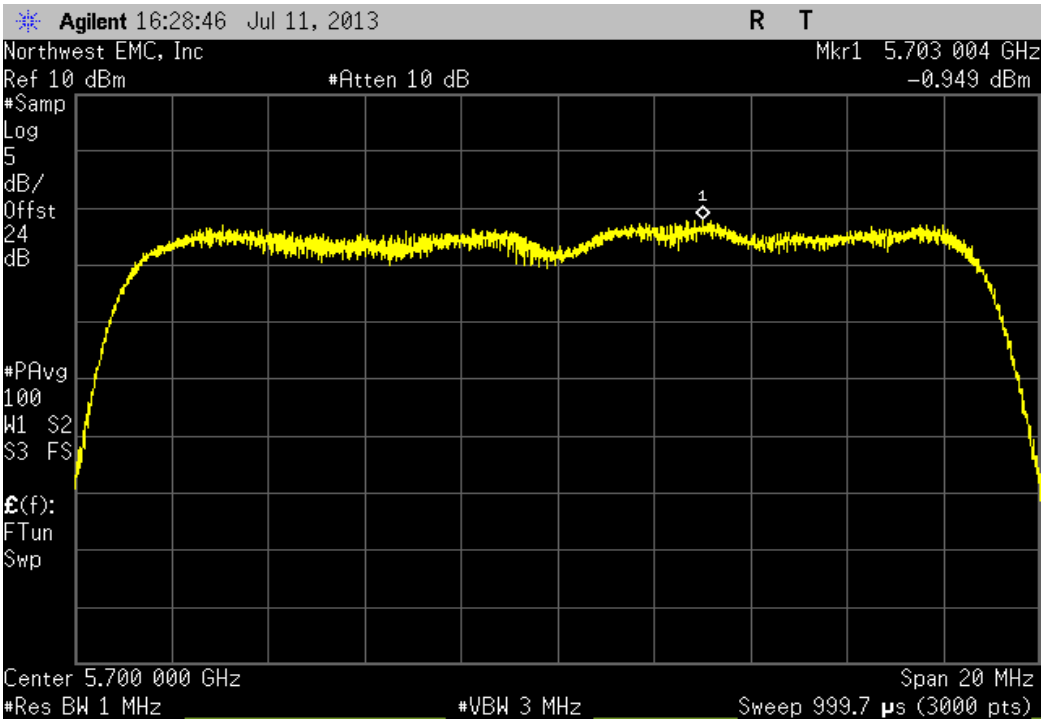


Peak Power Spectral Density - Antenna B

20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				1.037	11	Pass

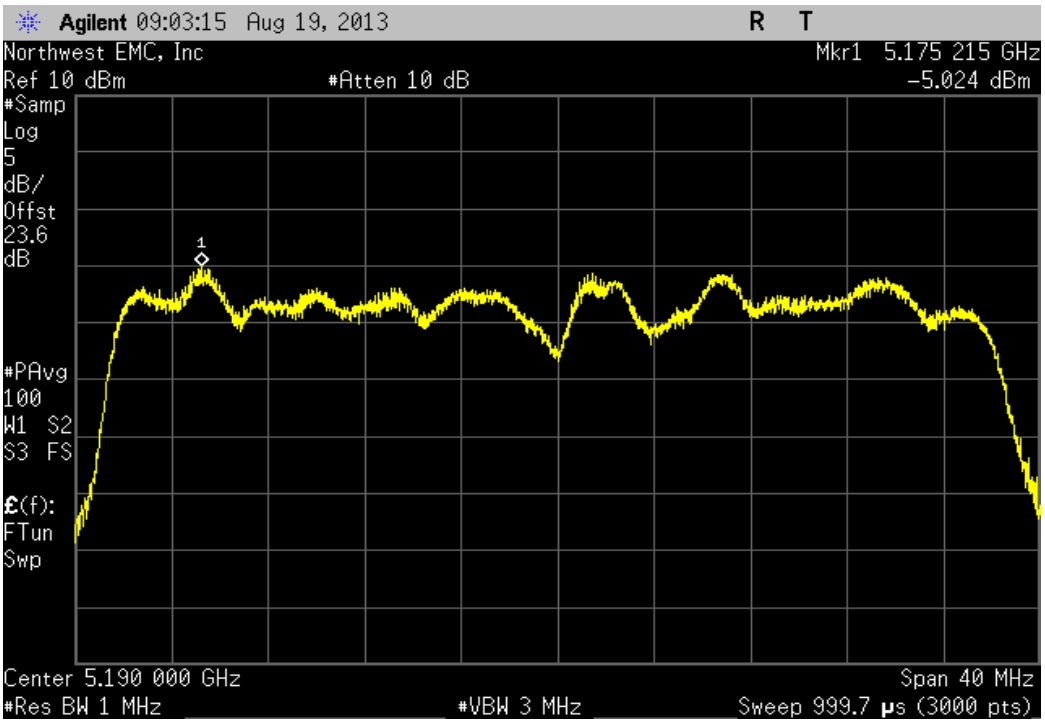


20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-0.949	11	Pass

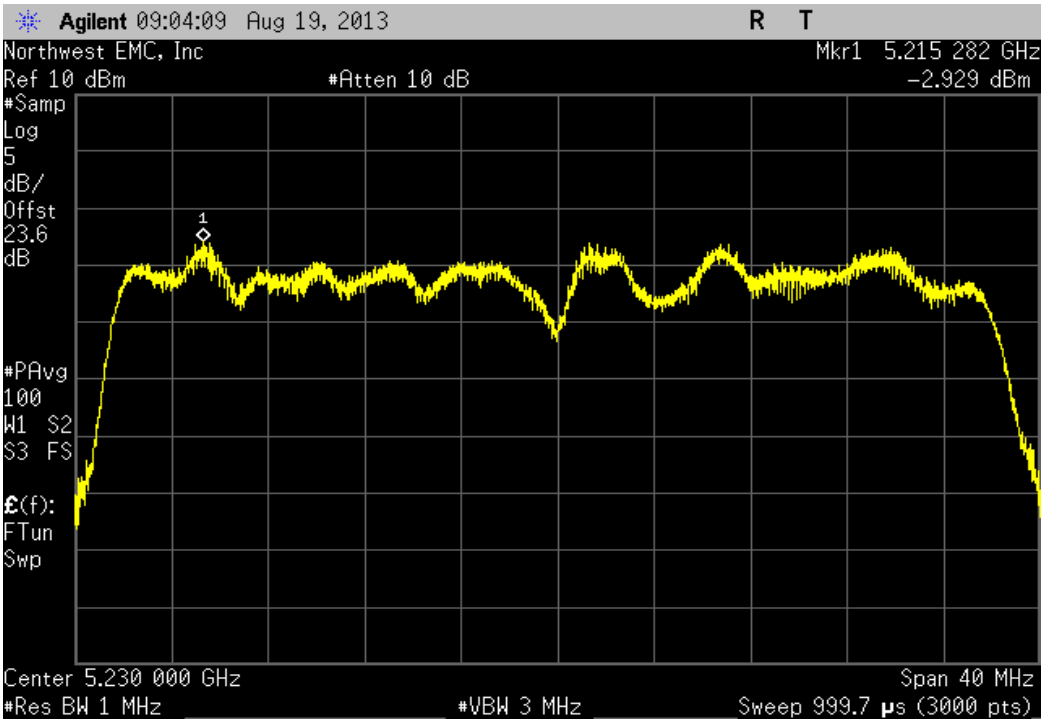


Peak Power Spectral Density - Antenna B

40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-5.024	4	Pass

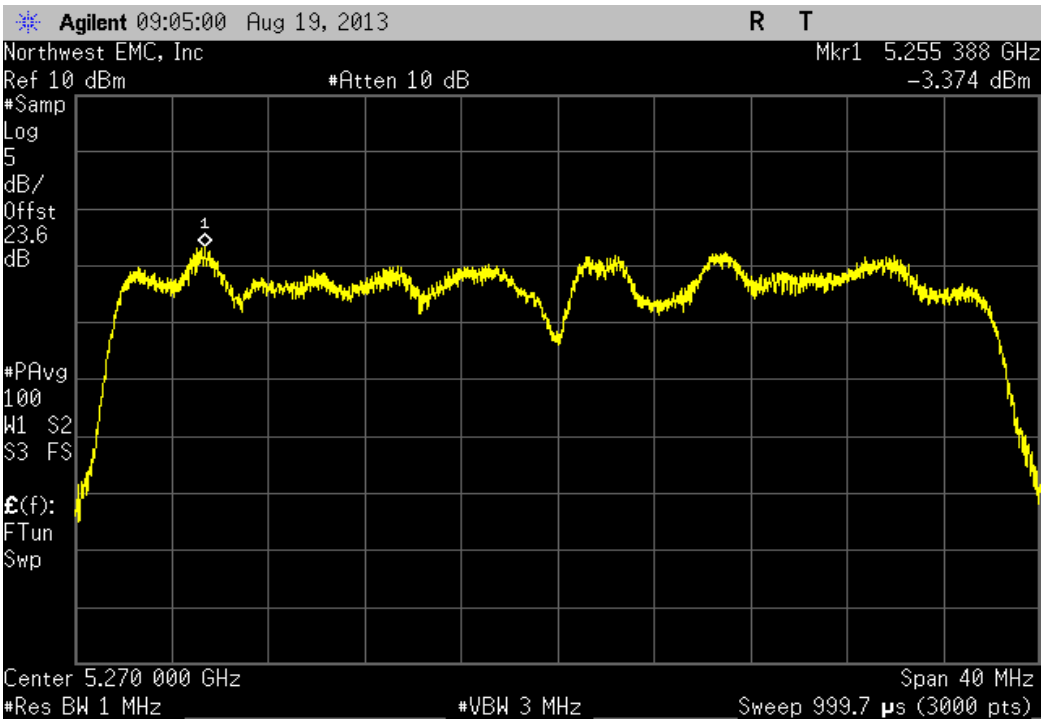


40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-2.929	4	Pass

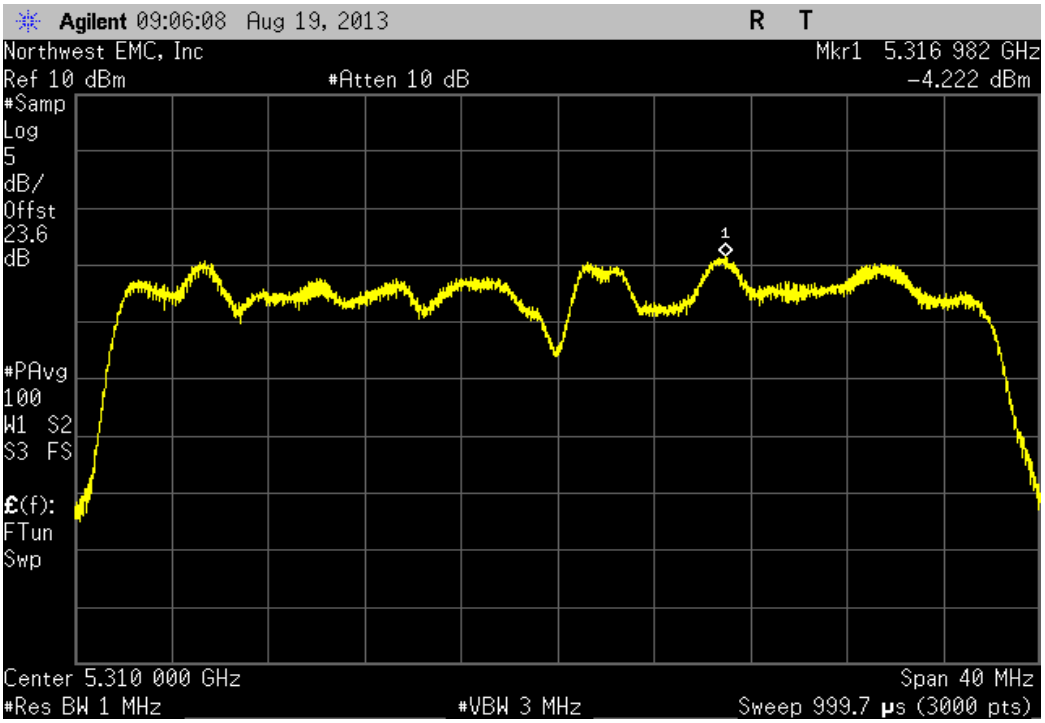


Peak Power Spectral Density - Antenna B

40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-3.374	11	Pass

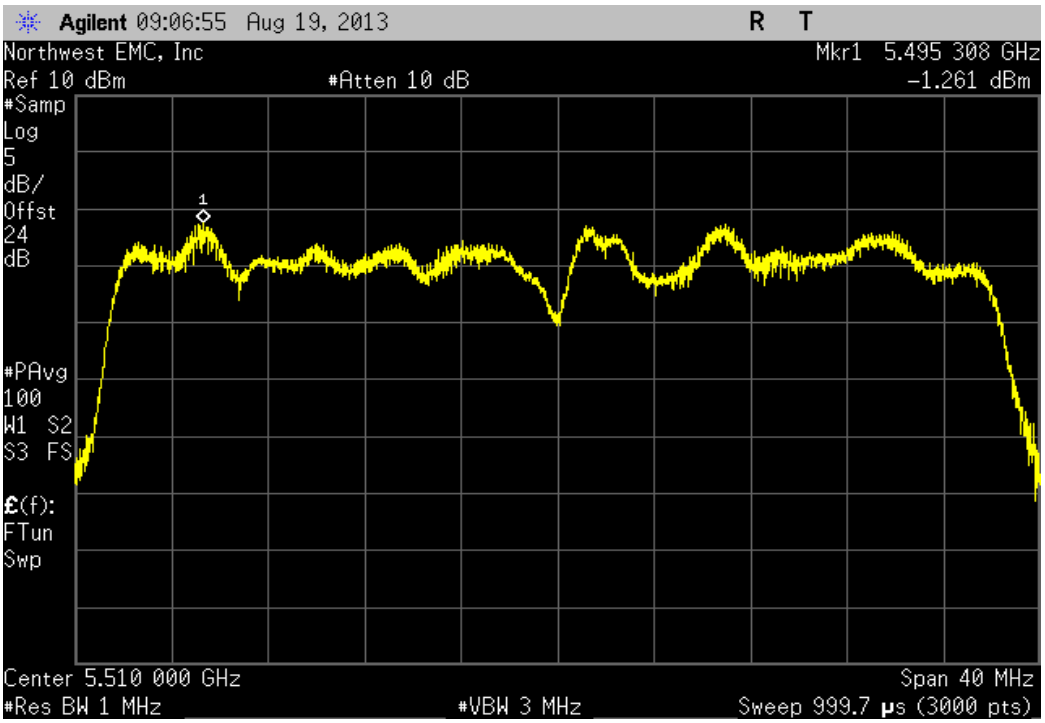


40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-4.222	11	Pass

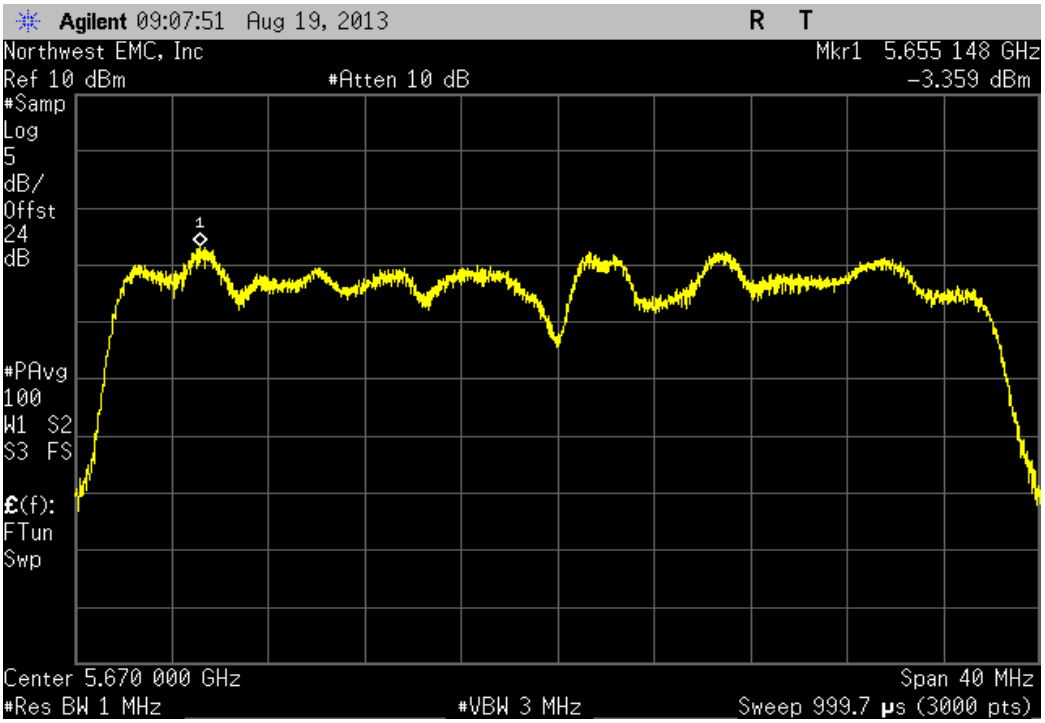


Peak Power Spectral Density - Antenna B

40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-1.261	11	Pass



40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz						
				Value (dBm / MHz)	Limit (dBm / MHz)	Result
				-3.359	11	Pass



Peak Excursion of the Modulation Envelope-Antenna A-B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

- 1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold..
- 2nd Trace: The same procedure and settings as was used for peak power spectral density

A DC block was used in-line for all measurements. The EUT power level was set to 12 dBm for all channels.

Peak Excursion of the Modulation Envelope-Antenna A-B

EUT:	1601	**Work Order:**	MCSO1665
Serial Number:	006079632553	**Date:**	07/12/13
Customer:	Microsoft Corporation	**Temperature:**	23°C
Attendees:	None	**Humidity:**	42%
Project:	None	**Barometric Pres.:**	1017 mb
Tested by:	Brandon Hobbs, Richard Mellroth	**Power:** 110VAC/60Hz	**Job Site:** NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel. Adapter cable loss of 1.3 dB added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

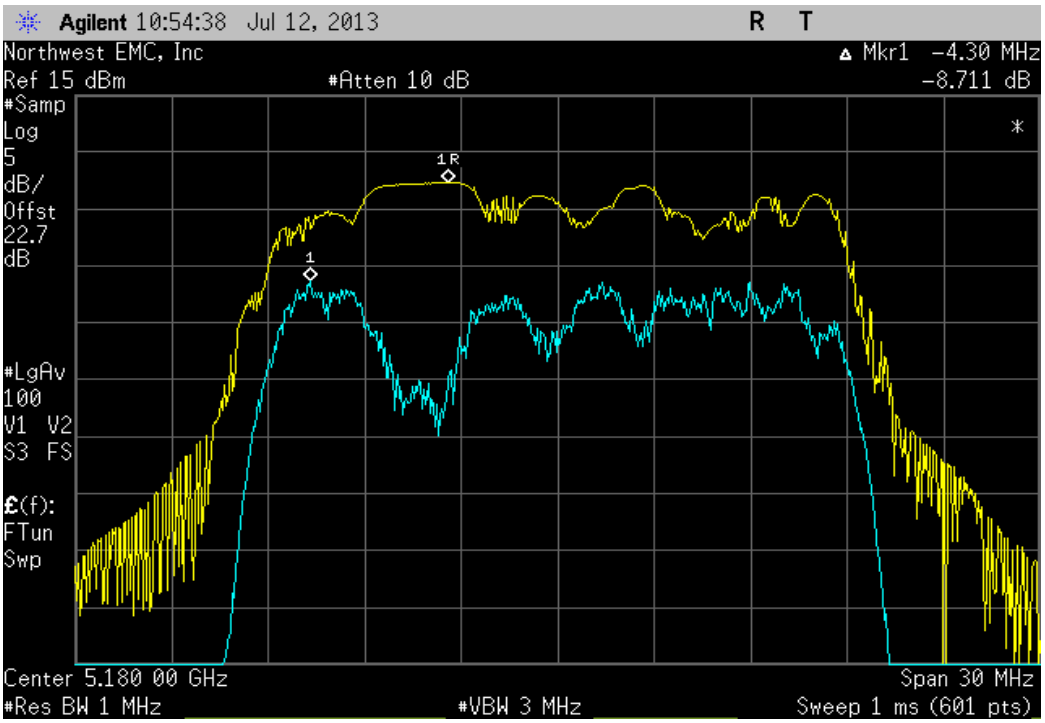
None

Configuration #	1	Signature

			Value	Limit	Result
Chain A					
	20 MHz				
		802.11(n) MCS15			
		Ch 36, Low Channel 5180 MHz	8.711 dB	≤ 13 dB	Pass
		Ch 48, High Channel 5240 MHz	8.752 dB	≤ 13 dB	Pass
		Ch 52, Low Channel 5260 MHz	8.702 dB	≤ 13 dB	Pass
		Ch 64, High Channel 5320 MHz	8.318 dB	≤ 13 dB	Pass
		Ch 100, Low Channel 5500 MHz	8.174 dB	≤ 13 dB	Pass
		Ch 116, Mid Channel 5580 MHz	8.327 dB	≤ 13 dB	Pass
		Ch 140, High Channel 5700 MHz	8.613 dB	≤ 13 dB	Pass
	40 MHz				
		802.11(n) MCS15			
		Ch 36/40, Low Channel 5190 MHz	10.2 dB	≤ 13 dB	Pass
		Ch 44/48, High Channel 5230 MHz	10.429 dB	≤ 13 dB	Pass
		Ch 52/56, Low Channel 5270 MHz	9.902 dB	≤ 13 dB	Pass
		Ch 60/64, High Channel 5310 MHz	10.345 dB	≤ 13 dB	Pass
		Ch 100/104, Low Channel 5510 MHz	10.075 dB	≤ 13 dB	Pass
		Ch 132/136, High Channel 5670 MHz	10.135 dB	≤ 13 dB	Pass
Chain B					
	20 MHz				
		802.11(n) MCS15			
		Ch 36, Low Channel 5180 MHz	8.312 dB	≤ 13 dB	Pass
		Ch 48, High Channel 5240 MHz	8.517 dB	≤ 13 dB	Pass
		Ch 52, Low Channel 5260 MHz	8.731 dB	≤ 13 dB	Pass
		Ch 64, High Channel 5320 MHz	8.385 dB	≤ 13 dB	Pass
		Ch 100, Low Channel 5500 MHz	8.723 dB	≤ 13 dB	Pass
		Ch 116, Mid Channel 5580 MHz	8.789 dB	≤ 13 dB	Pass
		Ch 140, High Channel 5700 MHz	8.373 dB	≤ 13 dB	Pass
	40 MHz				
		802.11(n) MCS15			
		Ch 36/40, Low Channel 5190 MHz	9.707 dB	≤ 13 dB	Pass
		Ch 44/48, High Channel 5230 MHz	9.39 dB	≤ 13 dB	Pass
		Ch 52/56, Low Channel 5270 MHz	9.302 dB	≤ 13 dB	Pass
		Ch 60/64, High Channel 5310 MHz	9.767 dB	≤ 13 dB	Pass
		Ch 100/104, Low Channel 5510 MHz	9.731 dB	≤ 13 dB	Pass
		Ch 132/136, High Channel 5670 MHz	9.349 dB	≤ 13 dB	Pass

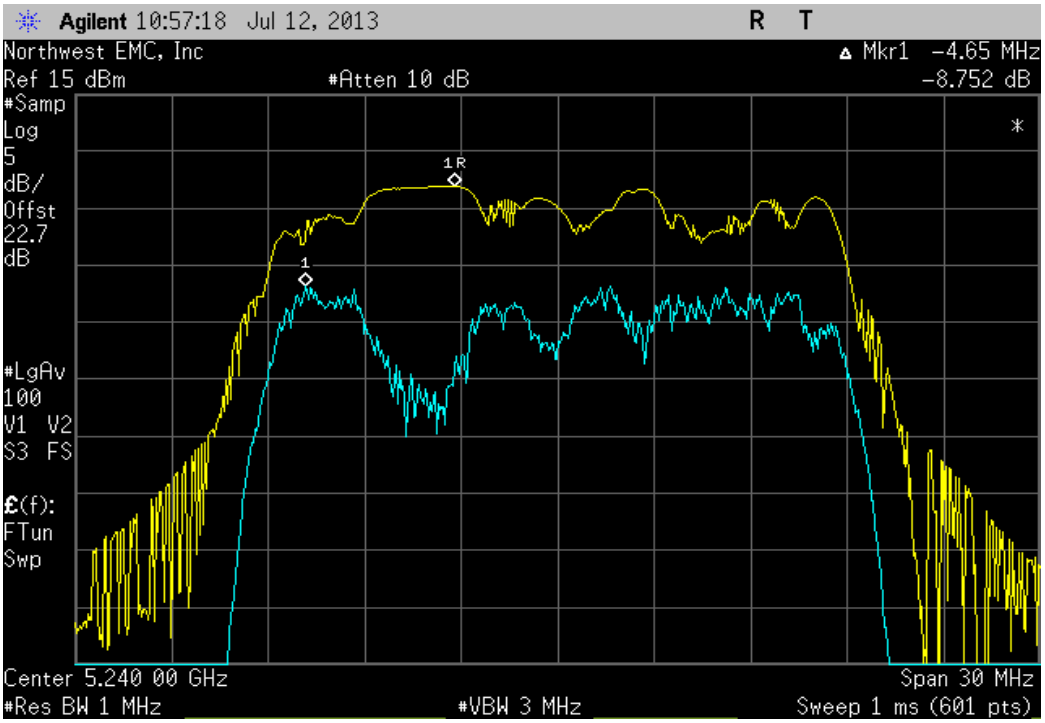
Chain A, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				8.711 dB	≤ 13 dB	Pass



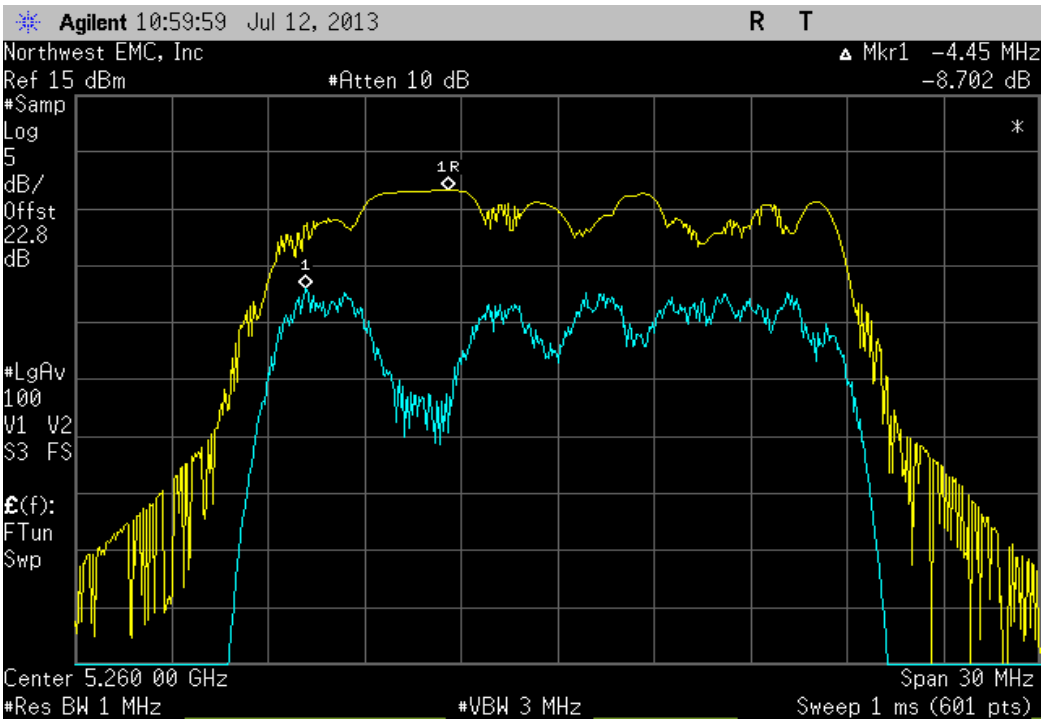
Chain A, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				8.752 dB	≤ 13 dB	Pass



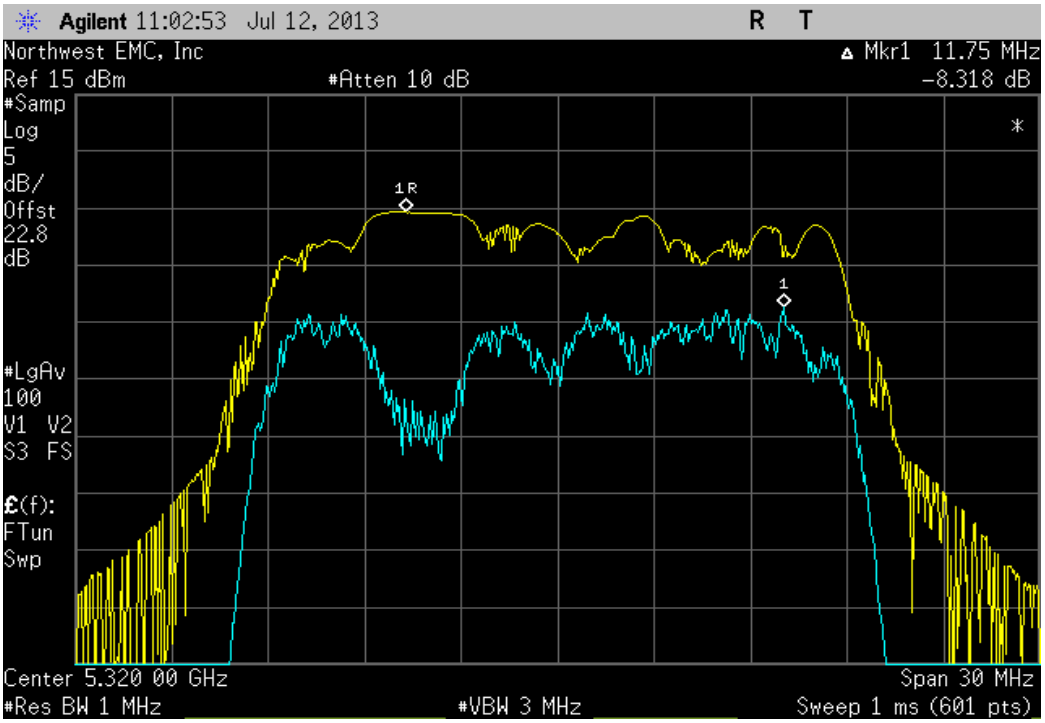
Chain A, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				8.702 dB	≤ 13 dB	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz

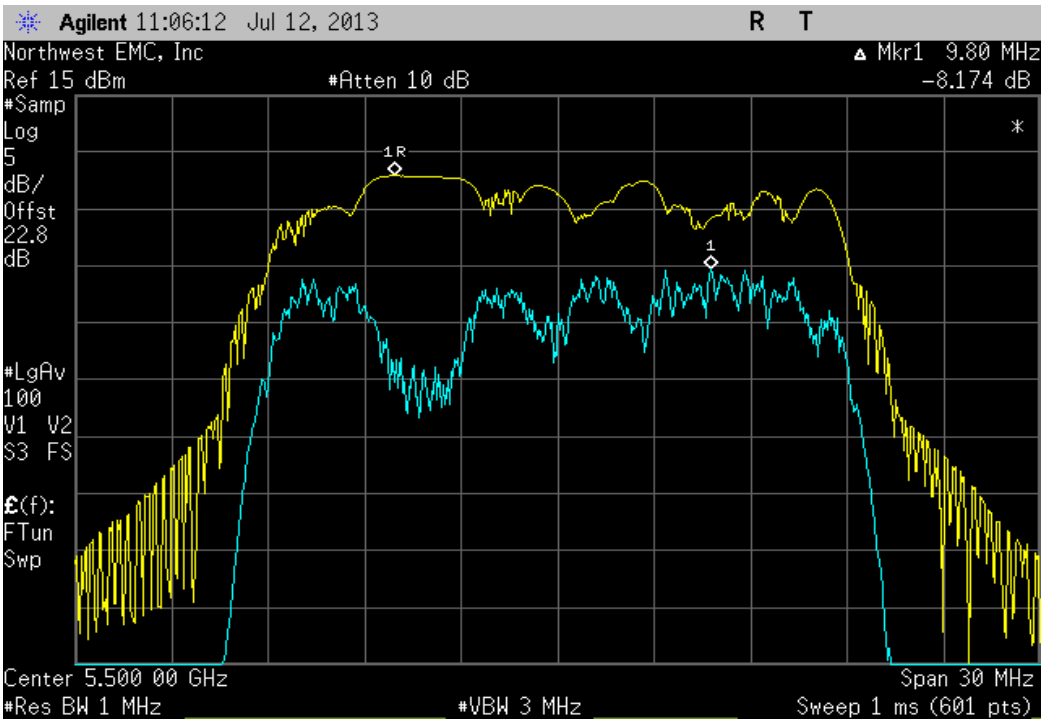
				Value	Limit	Result
				8.318 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna A-B

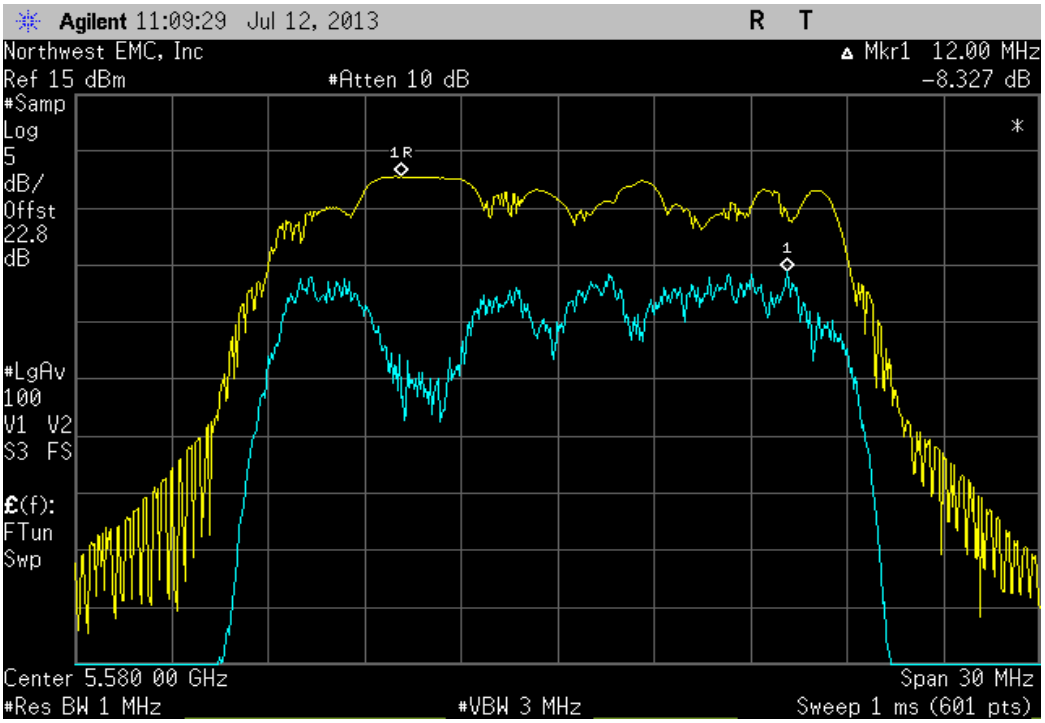
Chain A, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				8.174 dB	≤ 13 dB	Pass



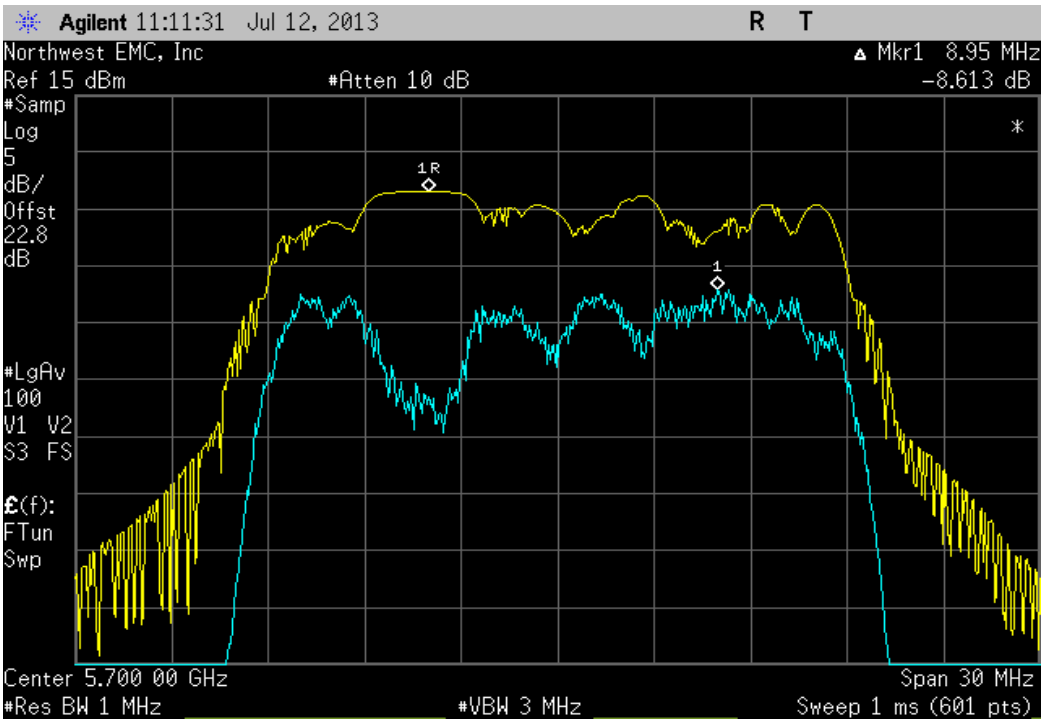
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				8.327 dB	≤ 13 dB	Pass



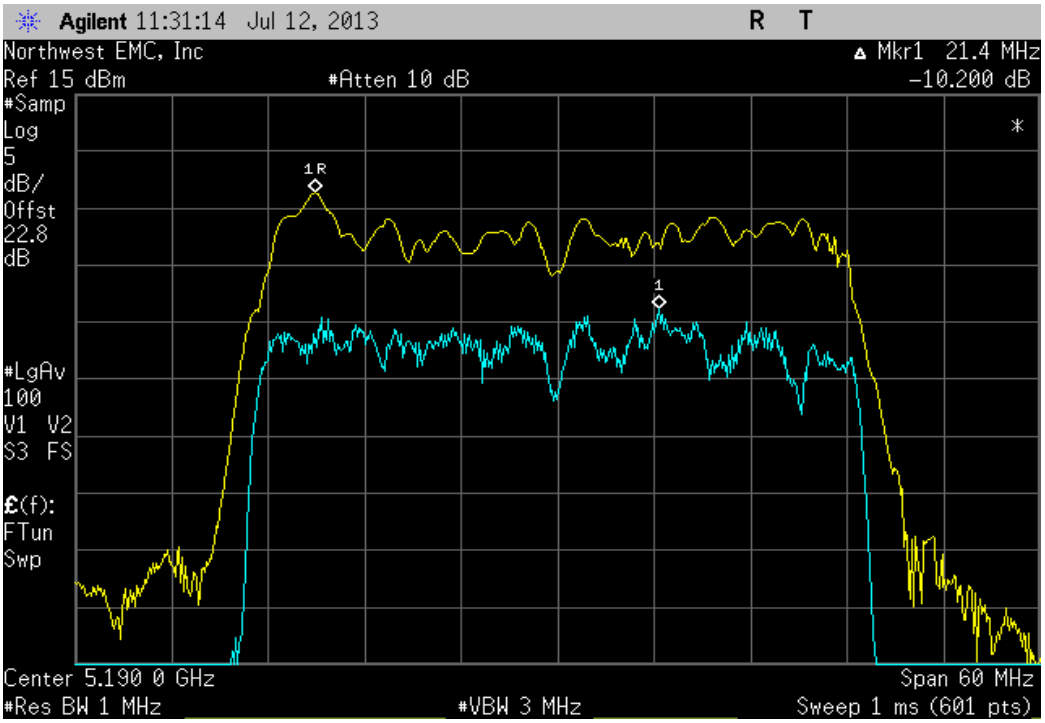
Chain A, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				8.613 dB	≤ 13 dB	Pass



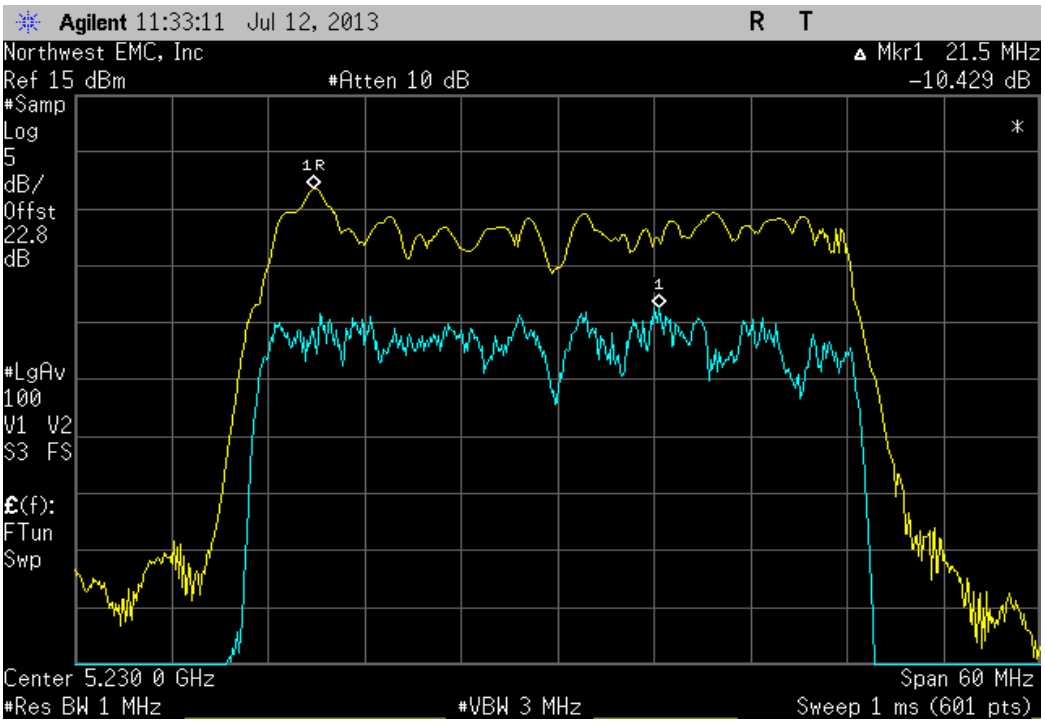
Chain A, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				10.2 dB	≤ 13 dB	Pass



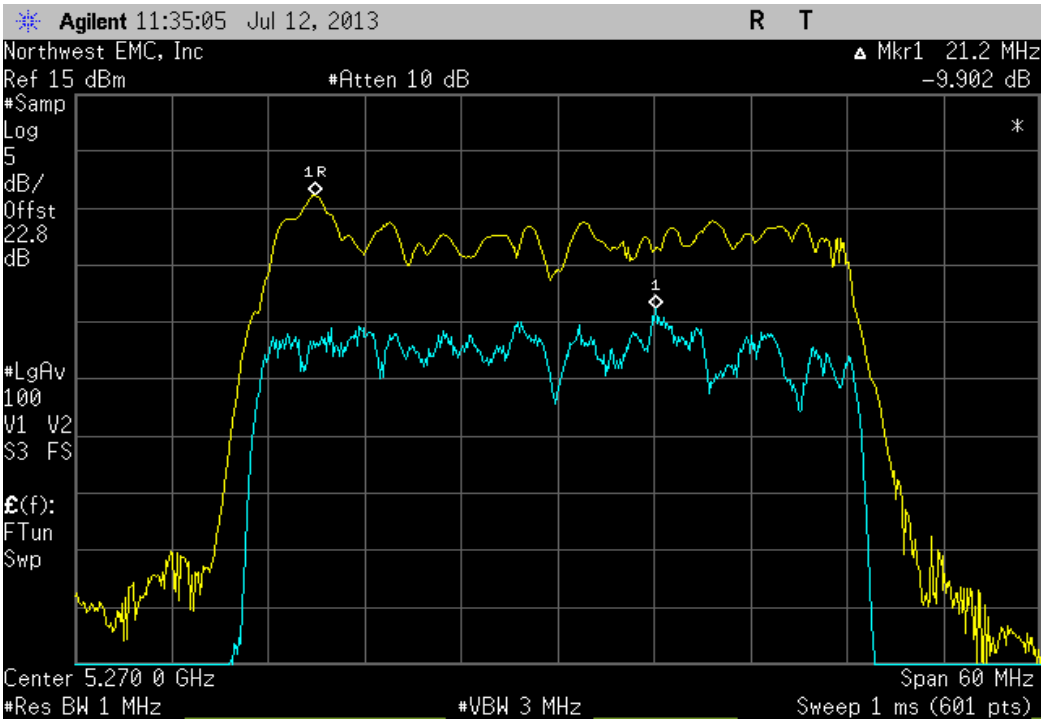
Chain A, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

				Value	Limit	Result
				10.429 dB	≤ 13 dB	Pass



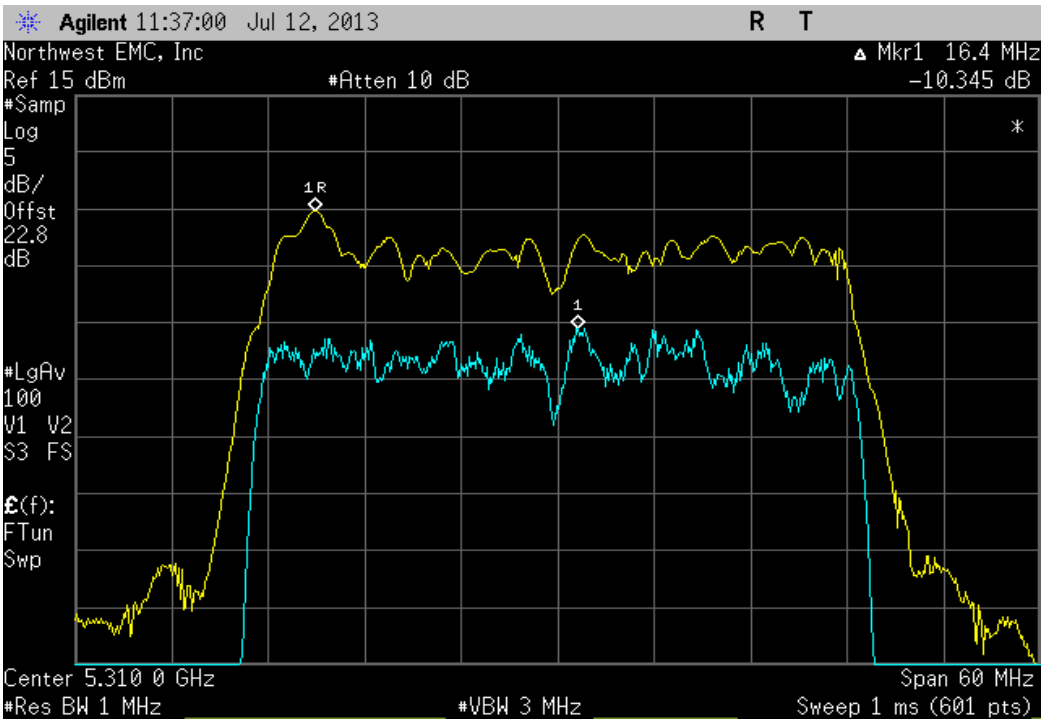
Chain A, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				9.902 dB	≤ 13 dB	Pass



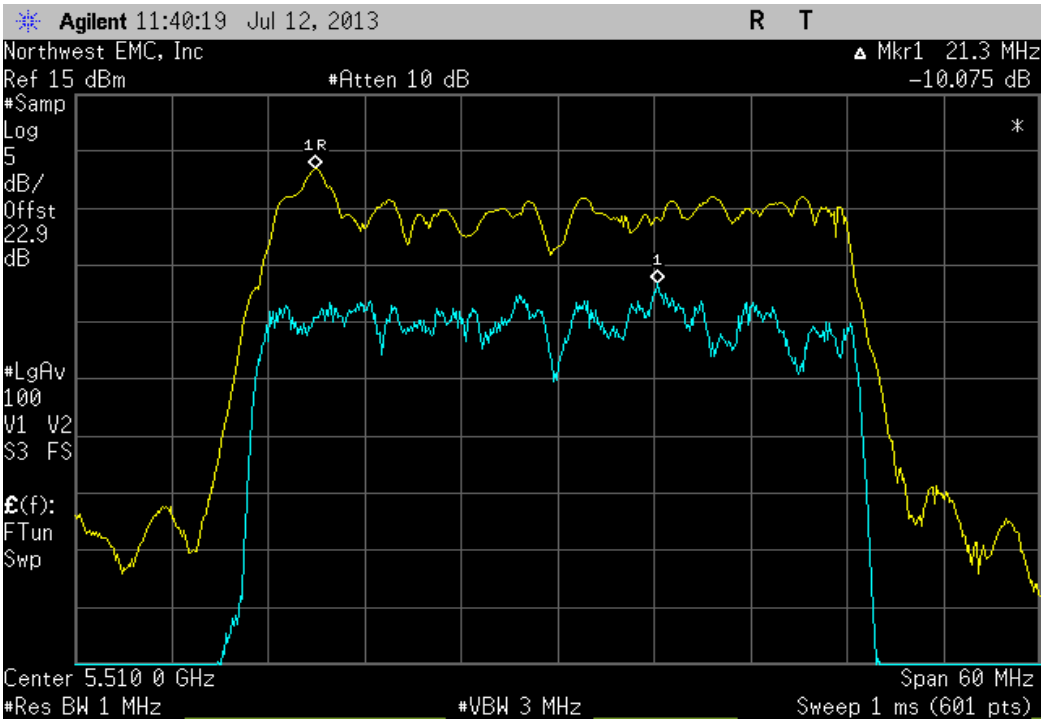
Chain A, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				10.345 dB	≤ 13 dB	Pass



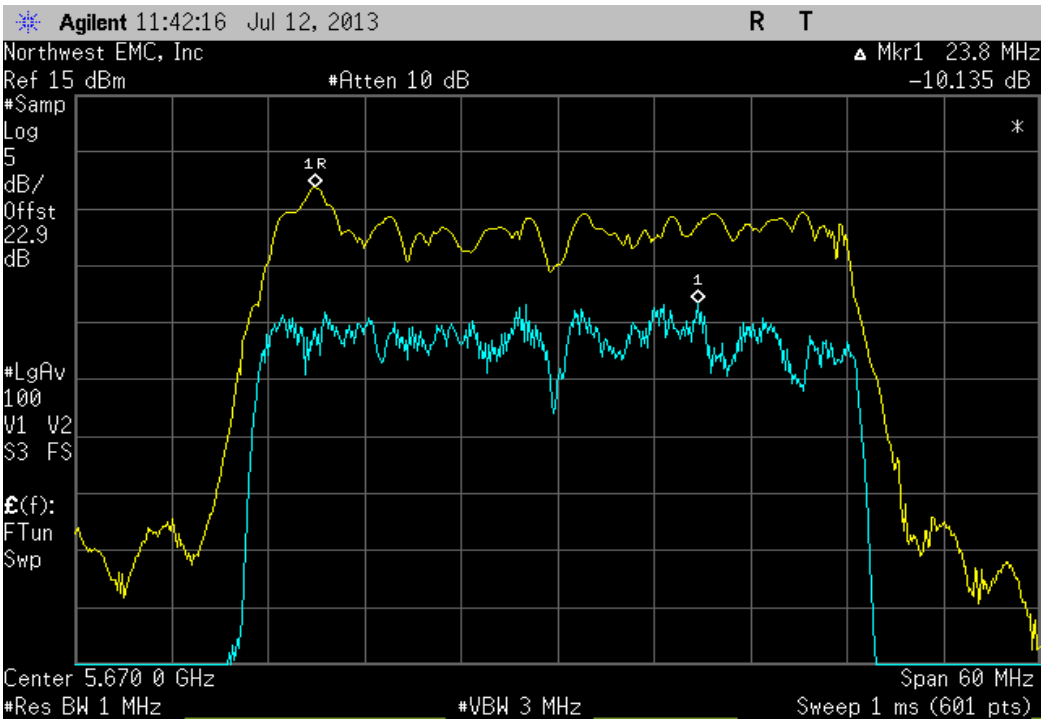
Chain A, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				10.075 dB	≤ 13 dB	Pass



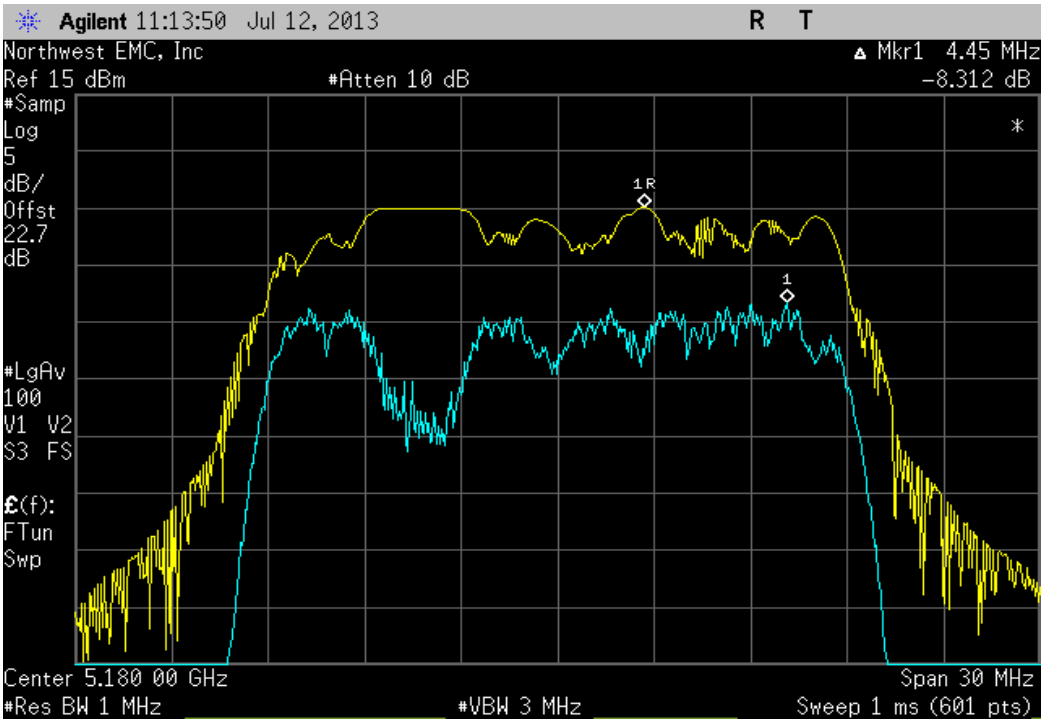
Chain A, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				10.135 dB	≤ 13 dB	Pass



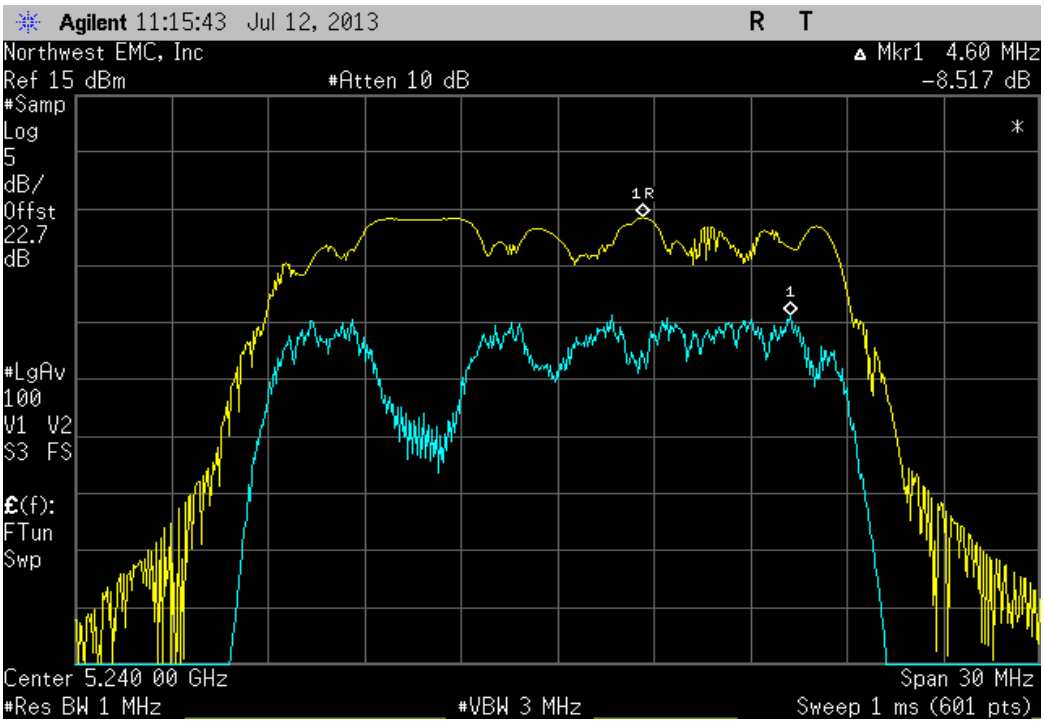
Chain B, 20 MHz, 802.11(n) MCS15, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				8.312 dB	≤ 13 dB	Pass



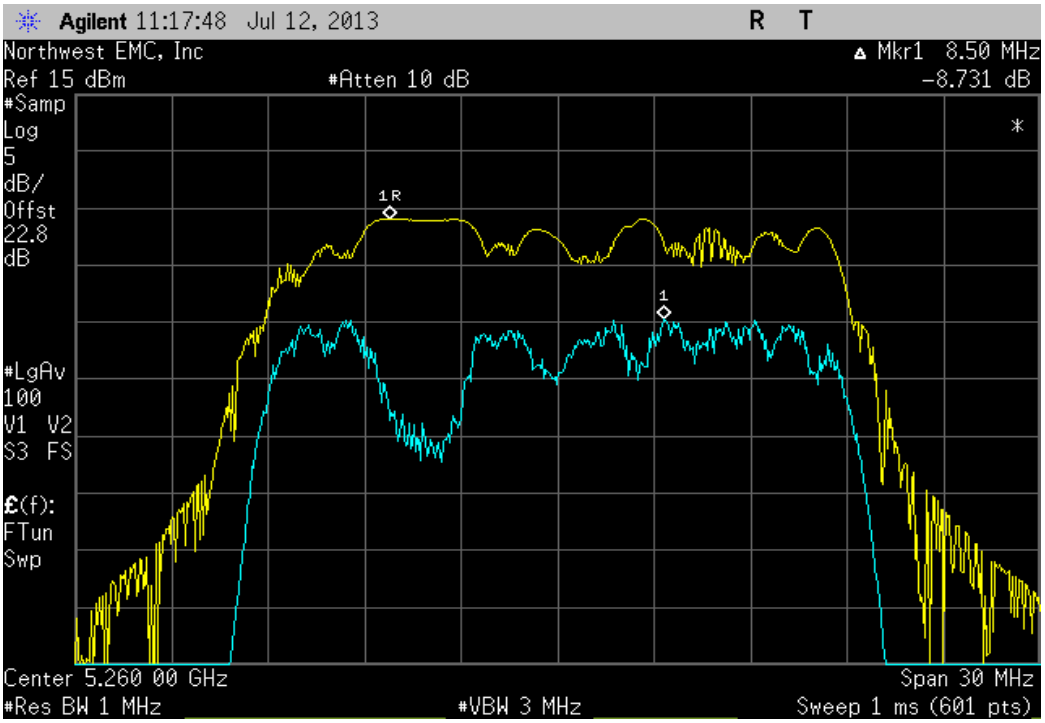
Chain B, 20 MHz, 802.11(n) MCS15, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				8.517 dB	≤ 13 dB	Pass



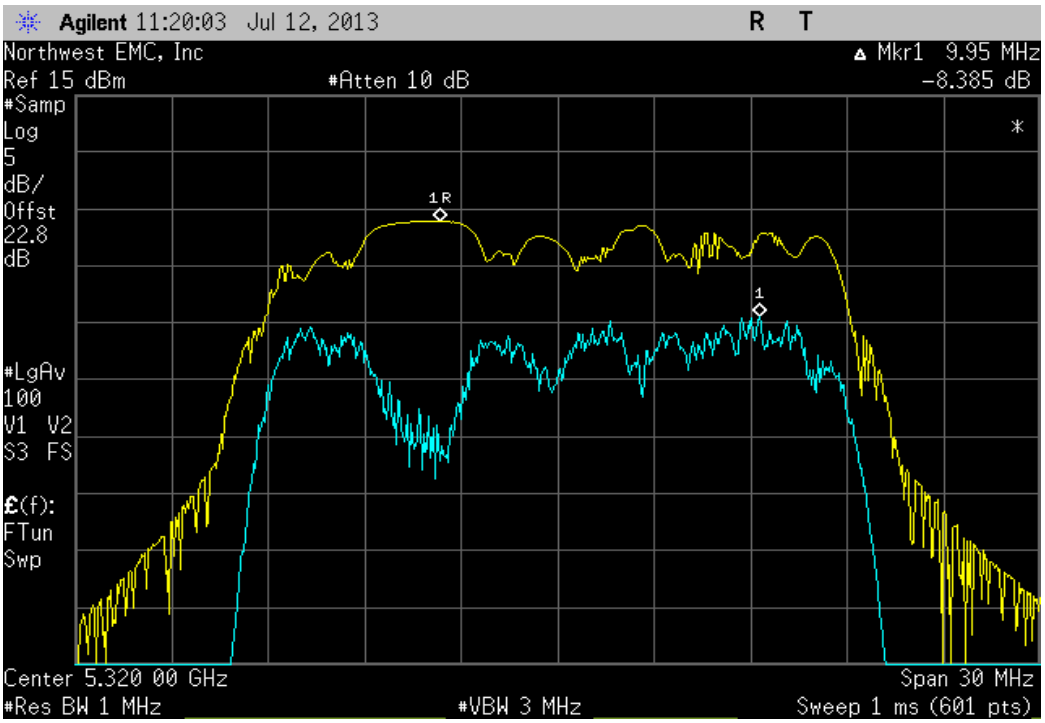
Chain B, 20 MHz, 802.11(n) MCS15, Ch 52, Low Channel 5260 MHz

				Value	Limit	Result
				8.731 dB	≤ 13 dB	Pass



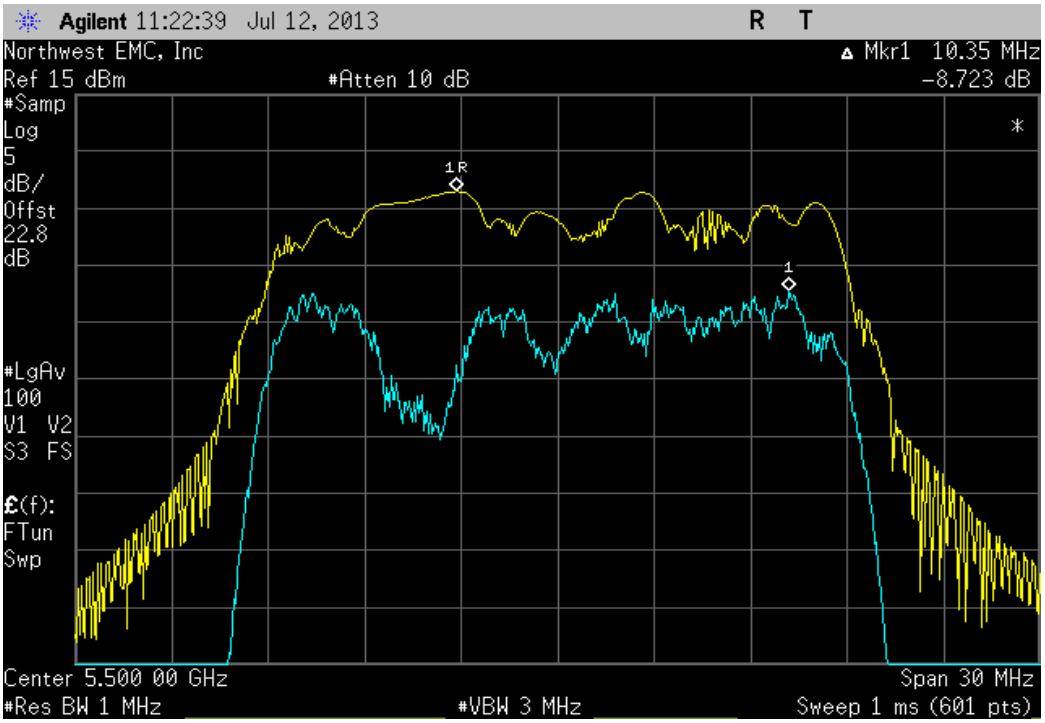
Chain B, 20 MHz, 802.11(n) MCS15, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				8.385 dB	≤ 13 dB	Pass



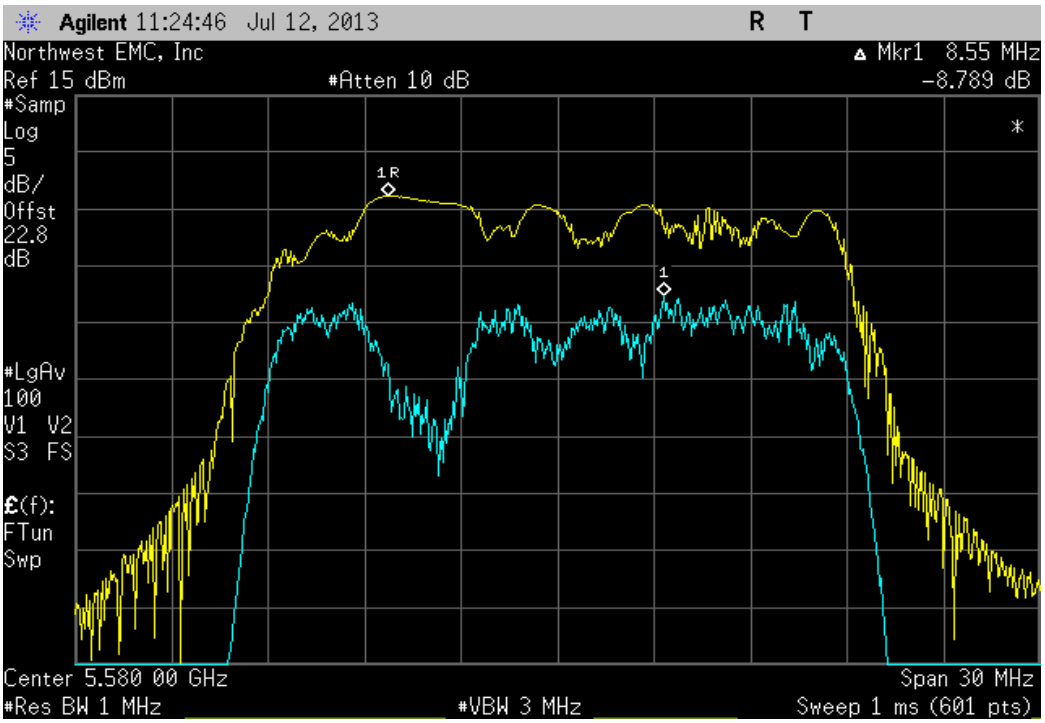
Chain B, 20 MHz, 802.11(n) MCS15, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				8.723 dB	≤ 13 dB	Pass



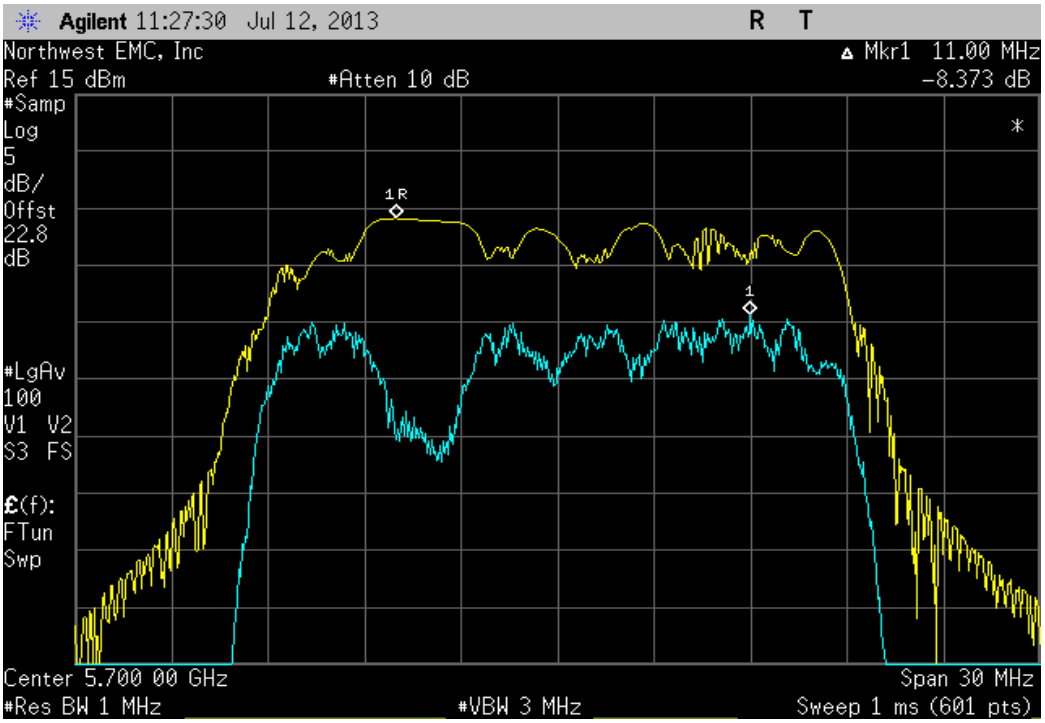
Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, Mid Channel 5580 MHz

				Value	Limit	Result
				8.789 dB	≤ 13 dB	Pass



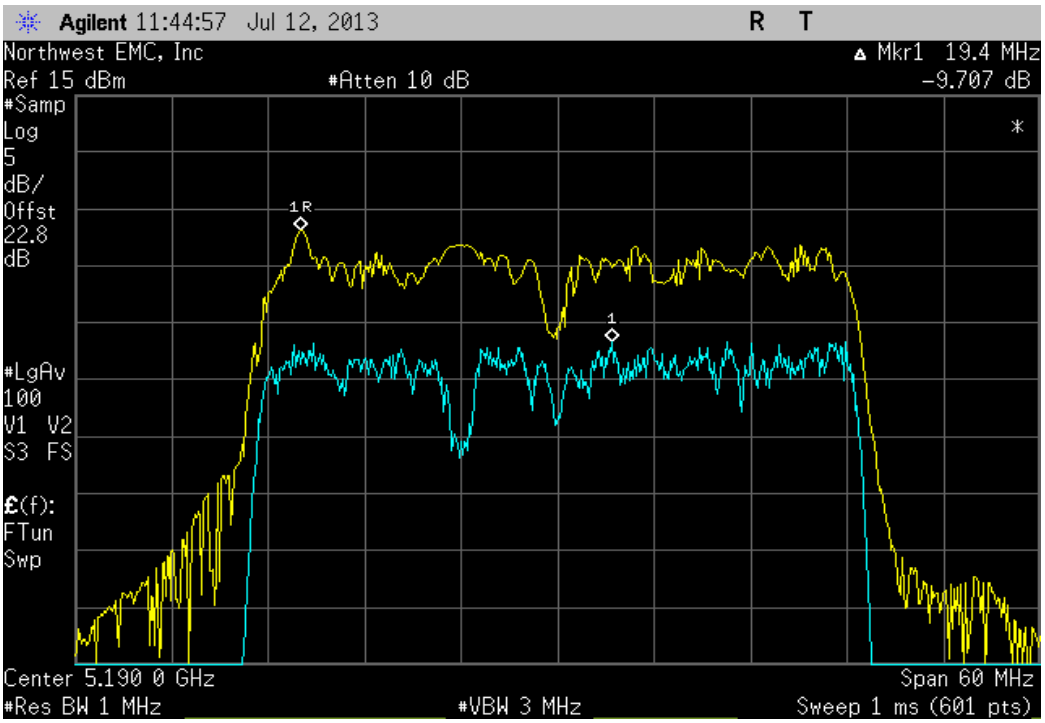
Chain B, 20 MHz, 802.11(n) MCS15, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				8.373 dB	≤ 13 dB	Pass



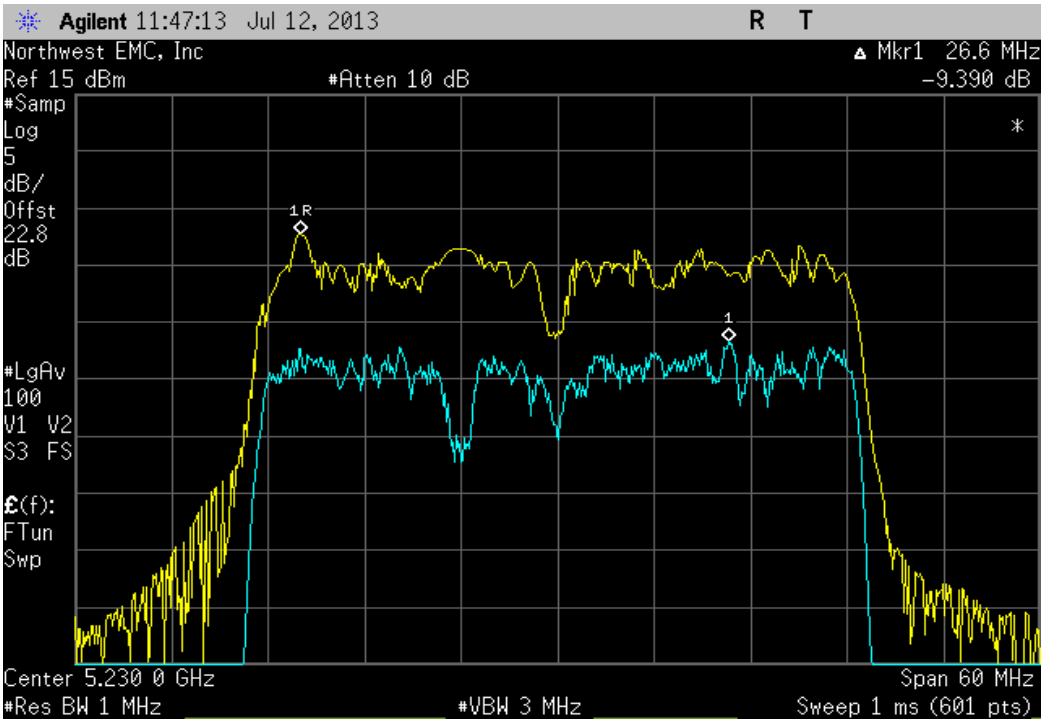
Chain B, 40 MHz, 802.11(n) MCS15, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				9.707 dB	≤ 13 dB	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 44/48, High Channel 5230 MHz

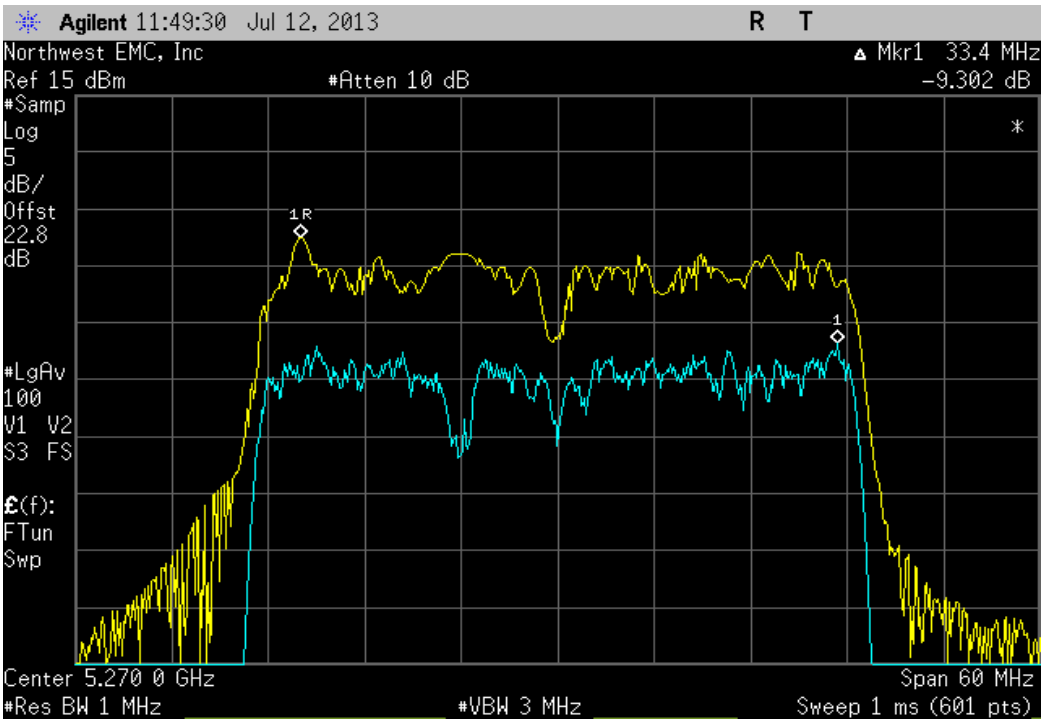
				Value	Limit	Result
				9.39 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna A-B

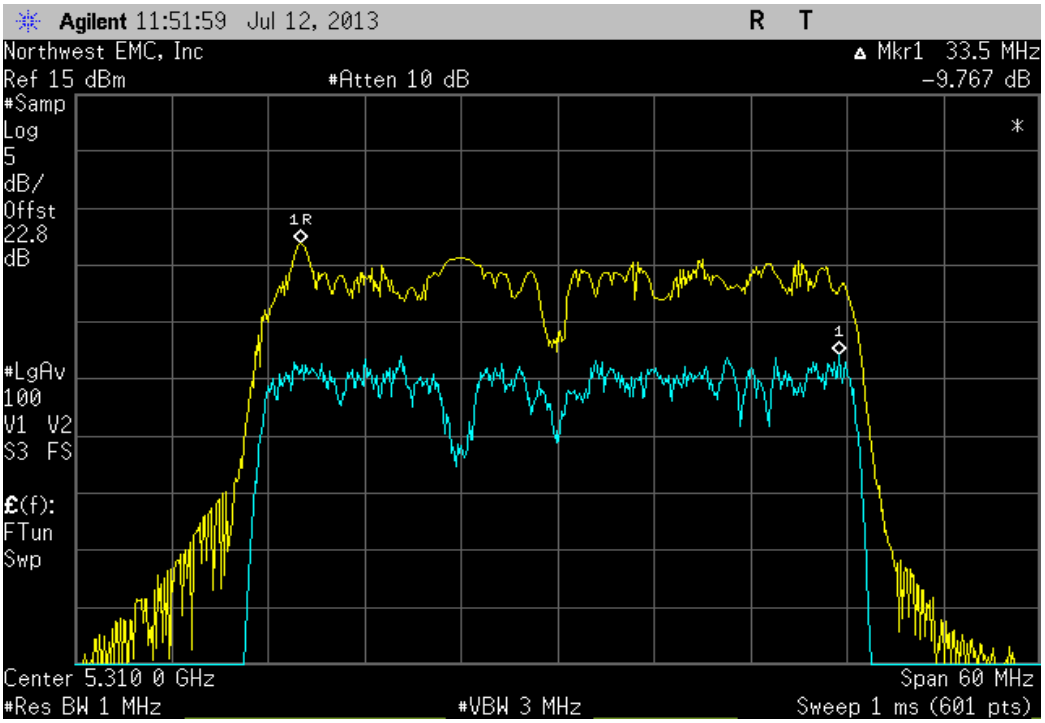
Chain B, 40 MHz, 802.11(n) MCS15, Ch 52/56, Low Channel 5270 MHz

				Value	Limit	Result
				9.302 dB	≤ 13 dB	Pass



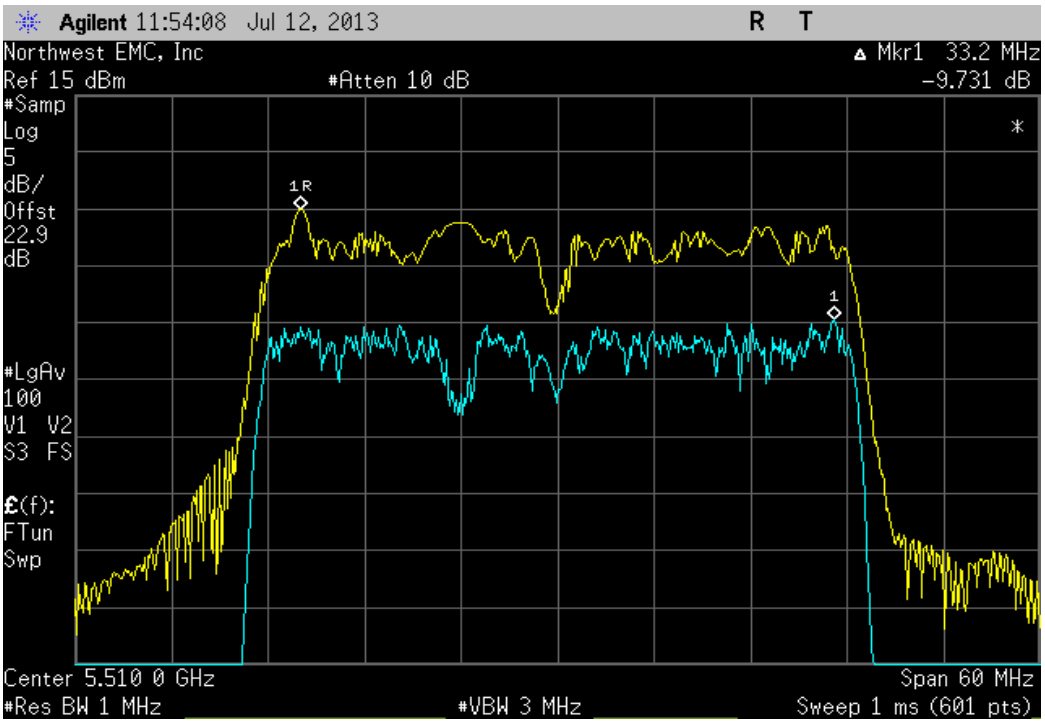
Chain B, 40 MHz, 802.11(n) MCS15, Ch 60/64, High Channel 5310 MHz

				Value	Limit	Result
				9.767 dB	≤ 13 dB	Pass



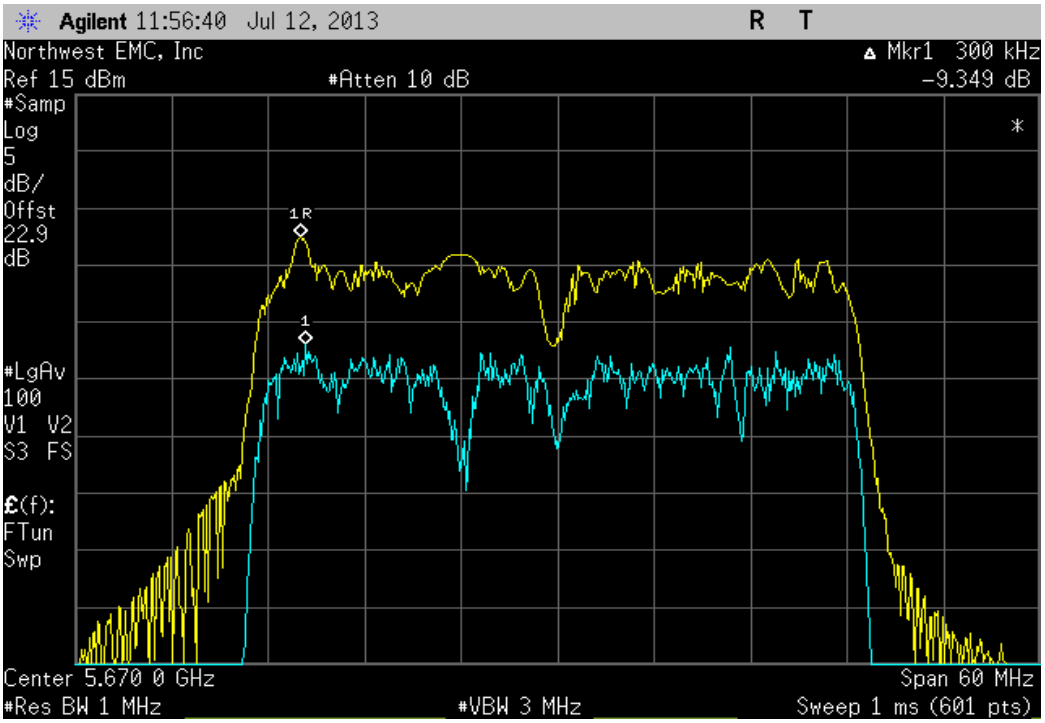
Chain B, 40 MHz, 802.11(n) MCS15, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				9.731 dB	≤ 13 dB	Pass



Chain B, 40 MHz, 802.11(n) MCS15, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				9.349 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

- 1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold..
- 2nd Trace: The same procedure and settings as was used for peak power spectral density

A DC block was used in-line for all measurements. The EUT was set to an output power of 12 dBm for all channels.

Peak Excursion of the Modulation Envelope - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	07/11/13
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	43%
Project:	None	Barometric Pres.:	1018 mb
Tested by:	Brandon Hobbs, Richard Mellroth	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel.

DEVIATIONS FROM TEST STANDARD

None

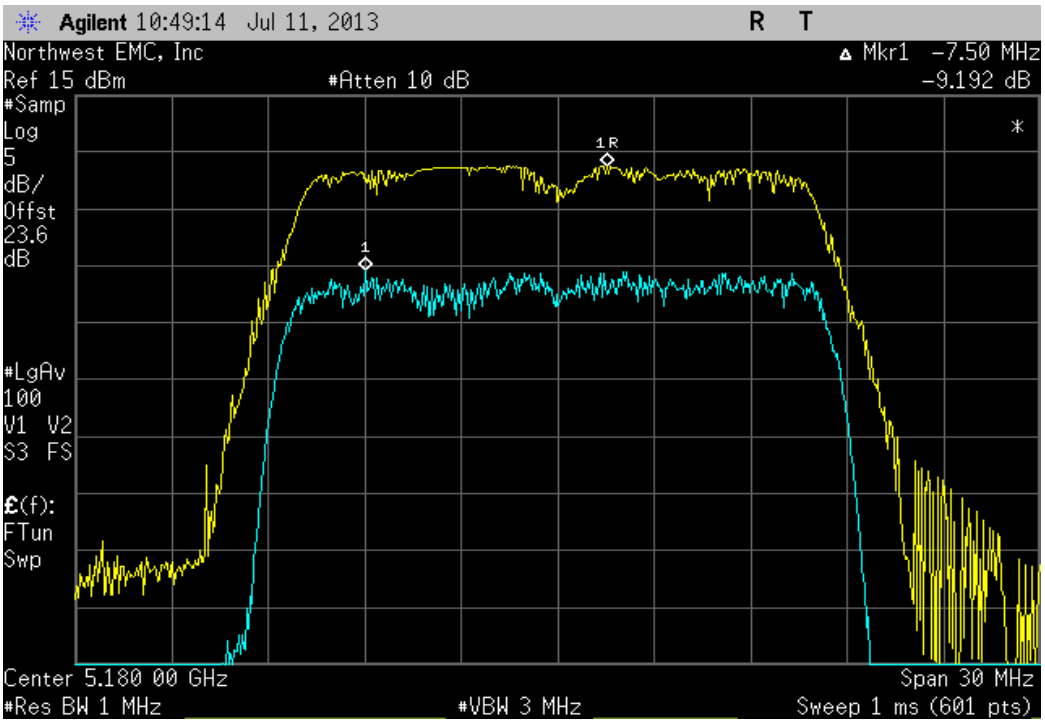
Configuration #	1	Signature

		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	9.192 dB	≤ 13 dB	Pass
	Ch 48, High Channel 5240 MHz	9.142 dB	≤ 13 dB	Pass
	Ch 52, Low Channel 5260 MHz	8.578 dB	≤ 13 dB	Pass
	Ch 64, High Channel 5320 MHz	9.11 dB	≤ 13 dB	Pass
	Ch 100, Low Channel 5500 MHz	9.088 dB	≤ 13 dB	Pass
	Ch 116, Mid Channel 5580 MHz	8.83 dB	≤ 13 dB	Pass
	Ch 140, High Channel 5700 MHz	9.083 dB	≤ 13 dB	Pass
	802.11(n) MCS7			
	Ch 36, Low Channel 5180 MHz	8.434 dB	≤ 13 dB	Pass
	Ch 48, High Channel 5240 MHz	8.412 dB	≤ 13 dB	Pass
	Ch 52, Low Channel 5260 MHz	8.389 dB	≤ 13 dB	Pass
	Ch 64, High Channel 5320 MHz	8.682 dB	≤ 13 dB	Pass
	Ch 100, Low Channel 5500 MHz	8.365 dB	≤ 13 dB	Pass
	Ch 116, Mid Channel 5580 MHz	8.374 dB	≤ 13 dB	Pass
	Ch 140, High Channel 5700 MHz	8.513 dB	≤ 13 dB	Pass
40 MHz				
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	9.886 dB	≤ 13 dB	Pass
	Ch 44/48, High Channel 5230 MHz	10.041 dB	≤ 13 dB	Pass
	Ch 52/56, Low Channel 5270 MHz	10.235 dB	≤ 13 dB	Pass
	Ch 60/64, High Channel 5310 MHz	9.855 dB	≤ 13 dB	Pass
	Ch 100/104, Low Channel 5510 MHz	10.179 dB	≤ 13 dB	Pass
	Ch 132/136, High Channel 5670 MHz	10.153 dB	≤ 13 dB	Pass

Peak Excursion of the Modulation Envelope - Antenna A

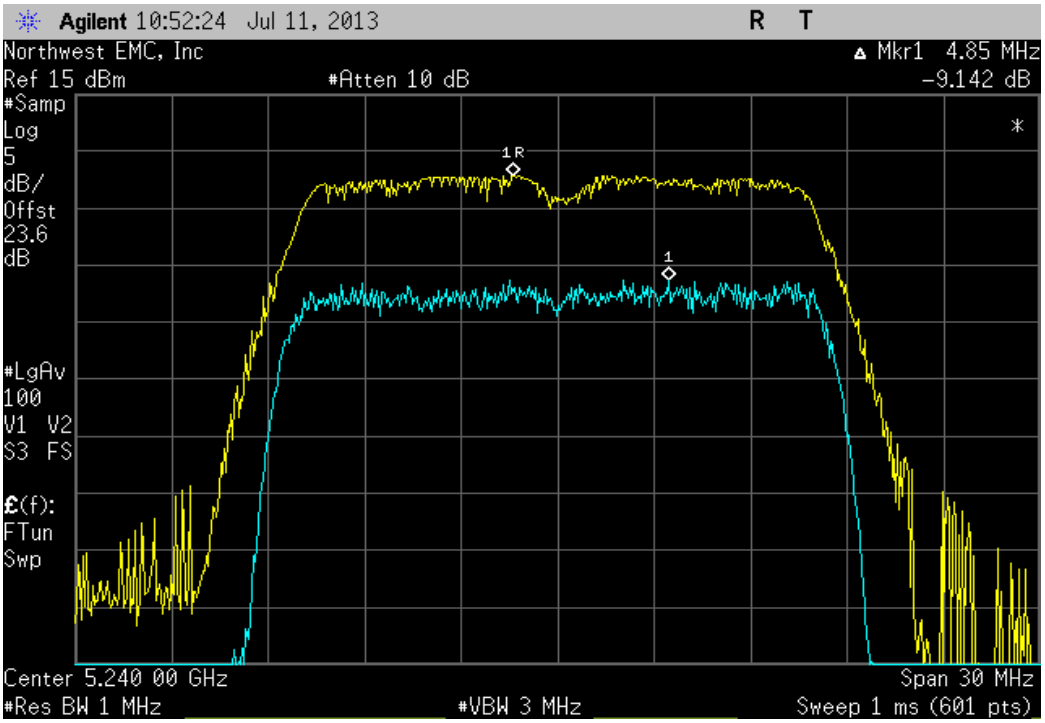
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				9.192 dB	≤ 13 dB	Pass



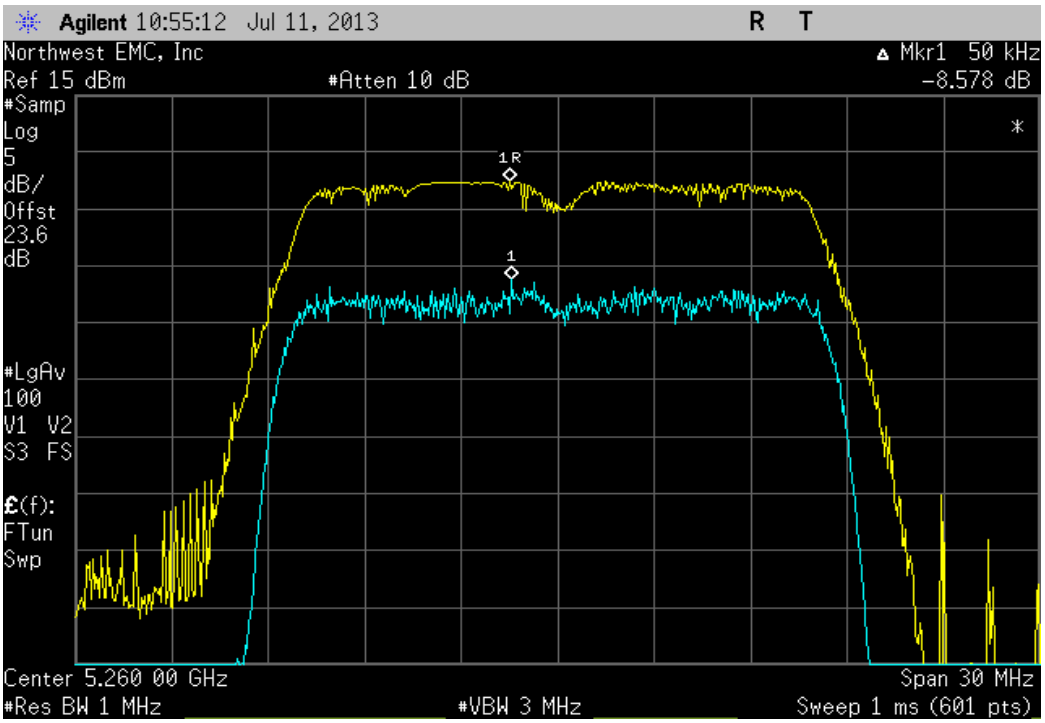
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				9.142 dB	≤ 13 dB	Pass

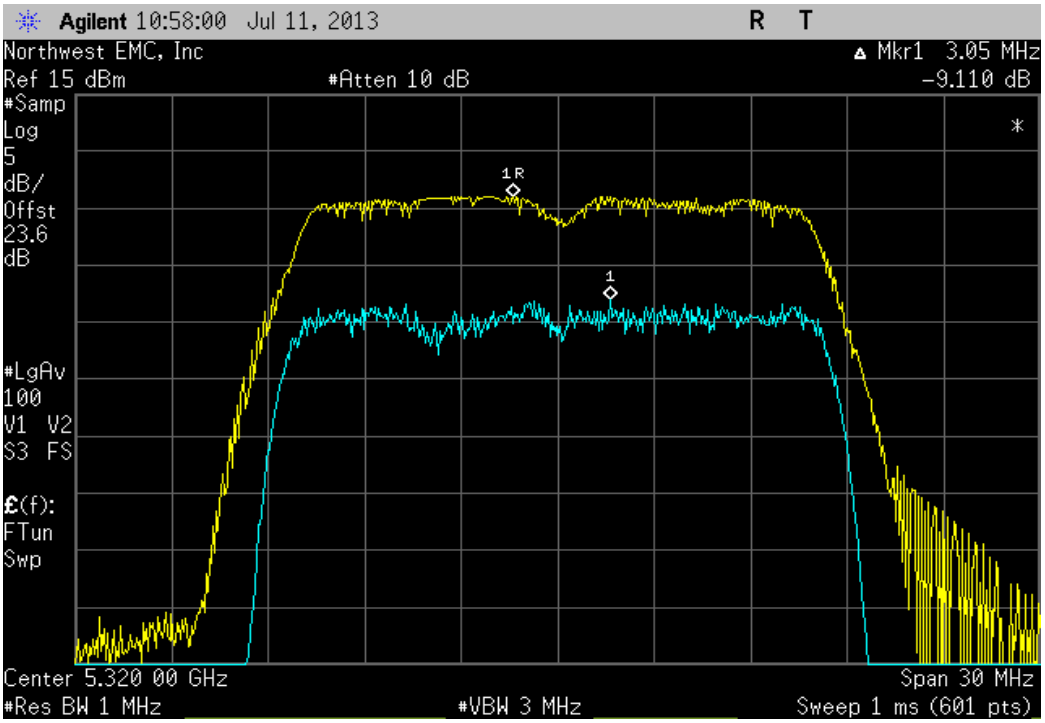


Peak Excursion of the Modulation Envelope - Antenna A

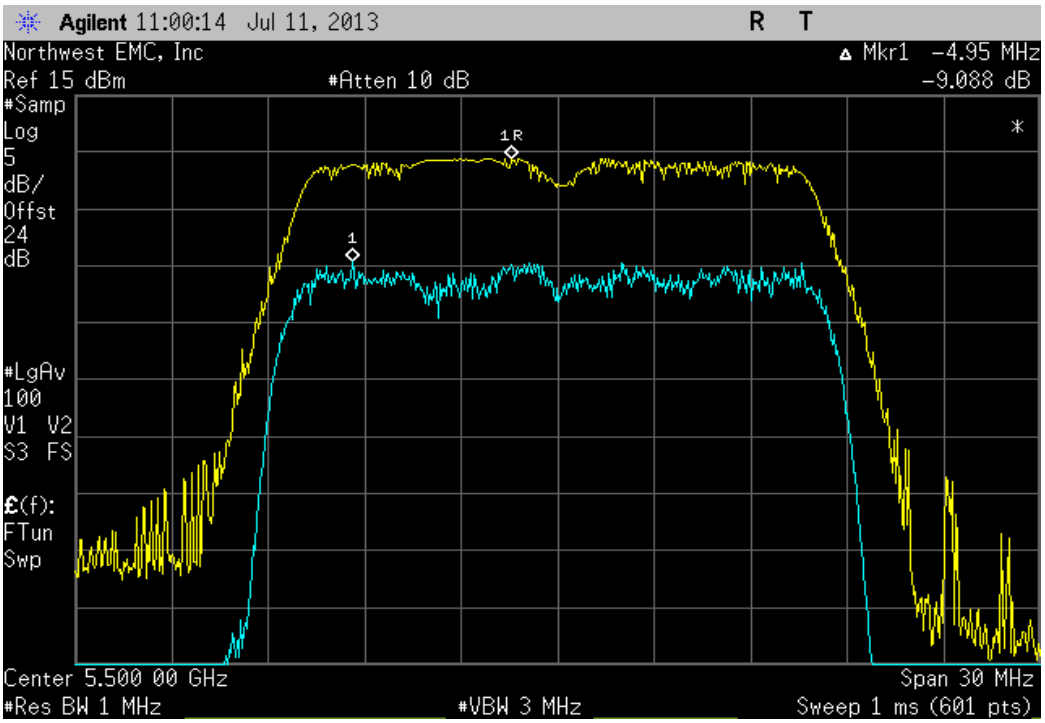
20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				8.578 dB	≤ 13 dB	Pass



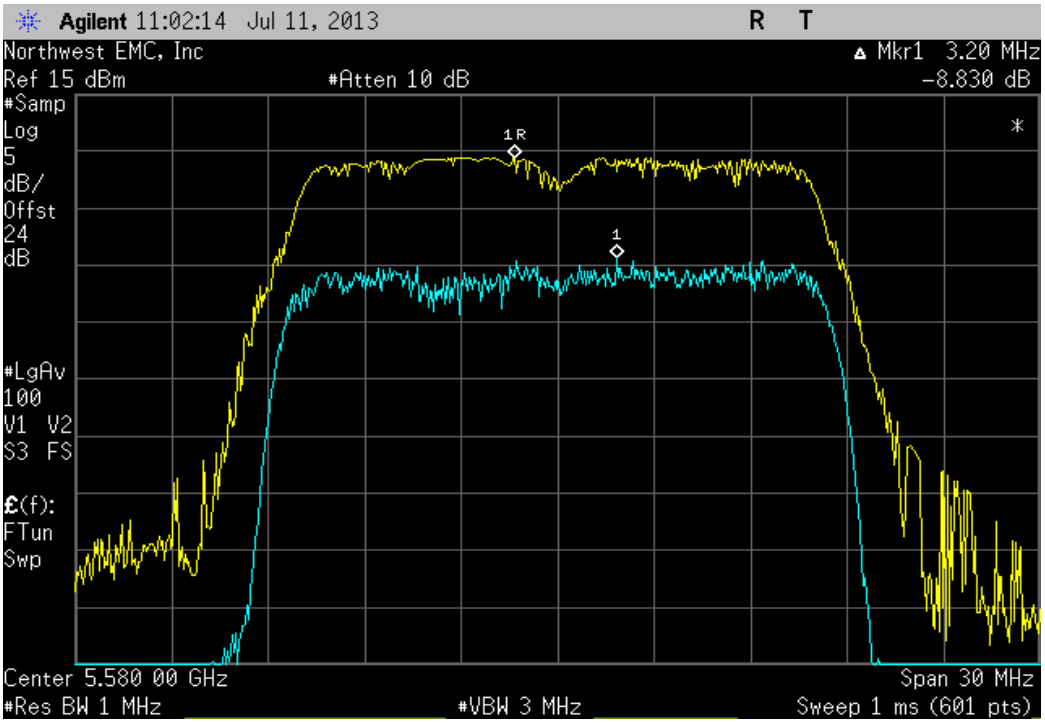
20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				9.11 dB	≤ 13 dB	Pass



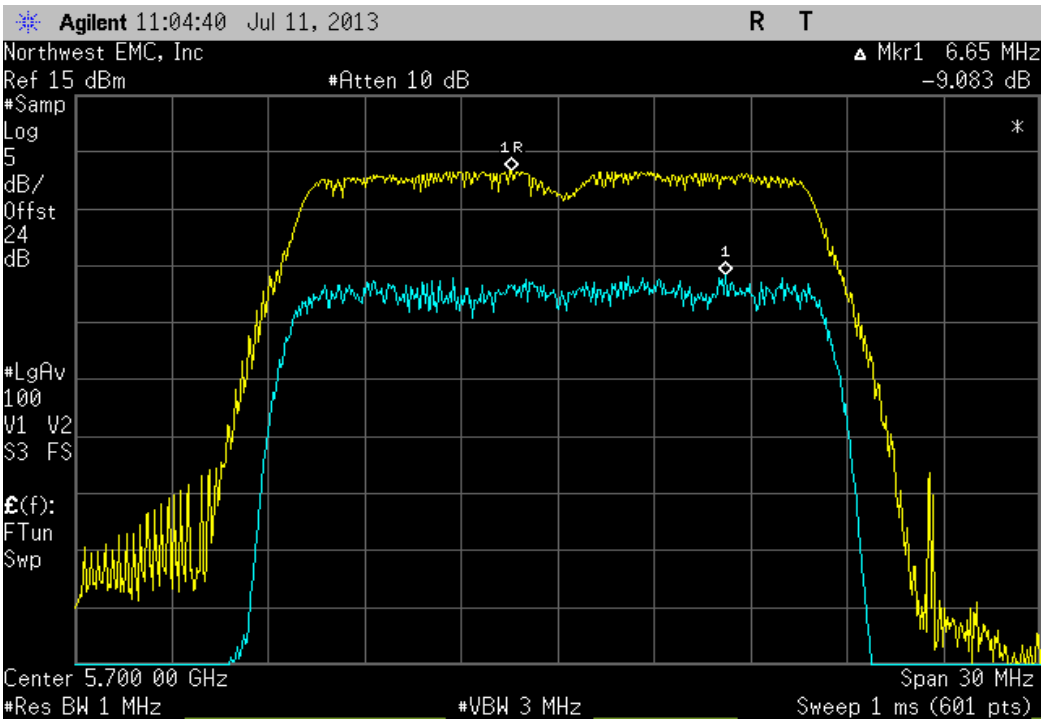
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				9.088 dB	≤ 13 dB	Pass



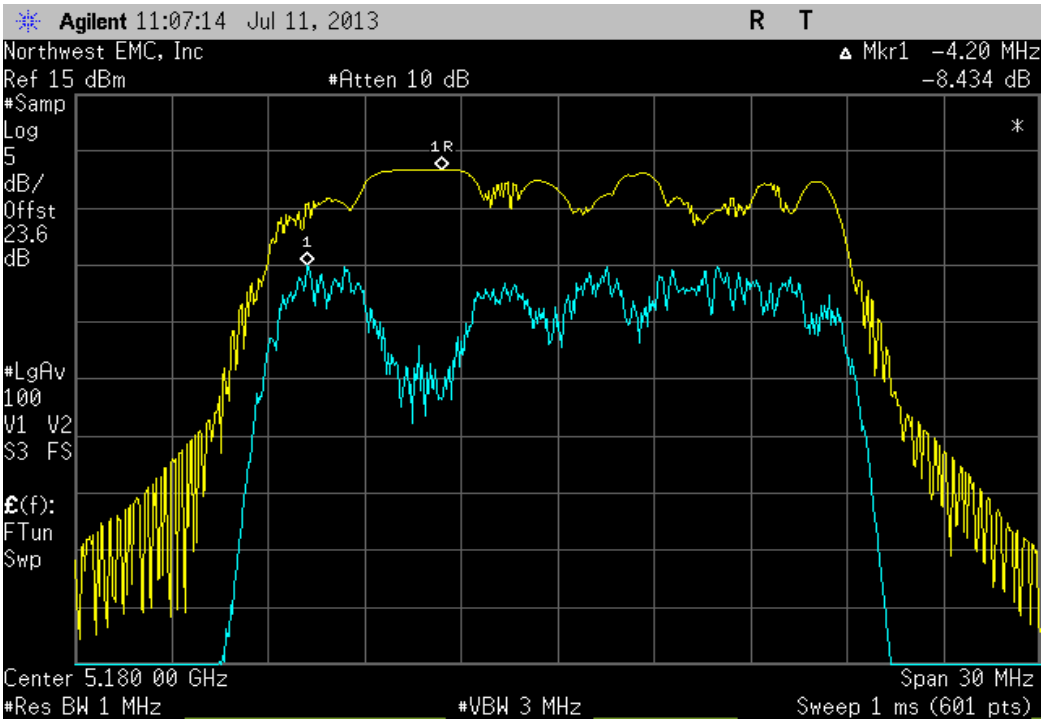
20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				8.83 dB	≤ 13 dB	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				9.083 dB	≤ 13 dB	Pass

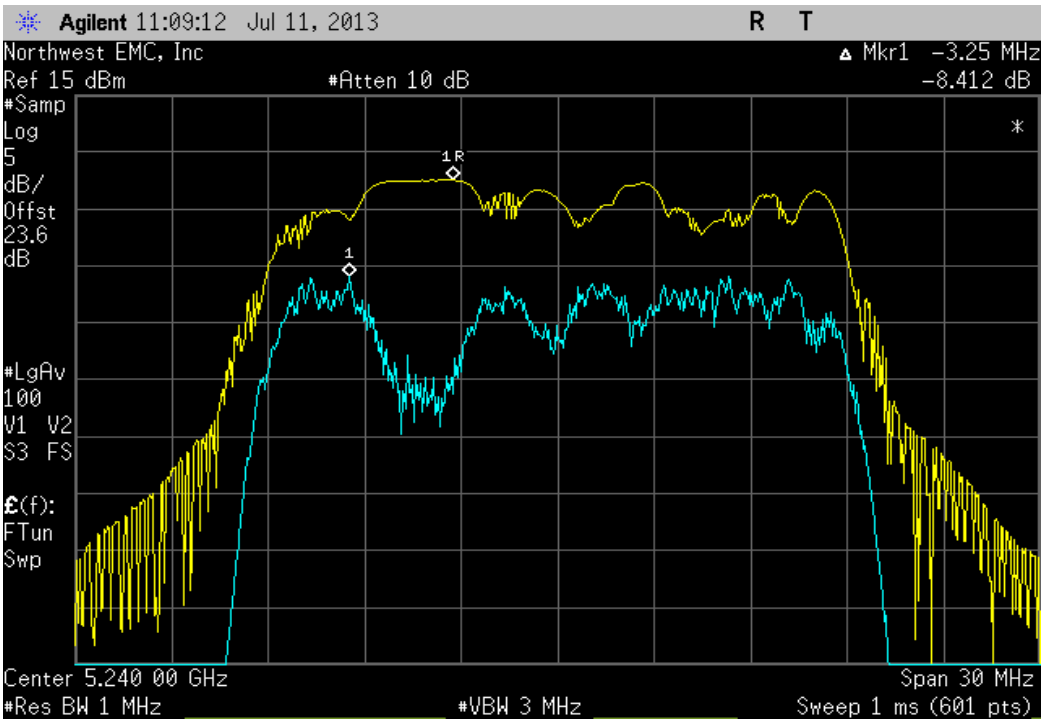


20 MHz, 802.11(n) MCS7, Ch 36, Low Channel 5180 MHz						
				Value	Limit	Result
				8.434 dB	≤ 13 dB	Pass

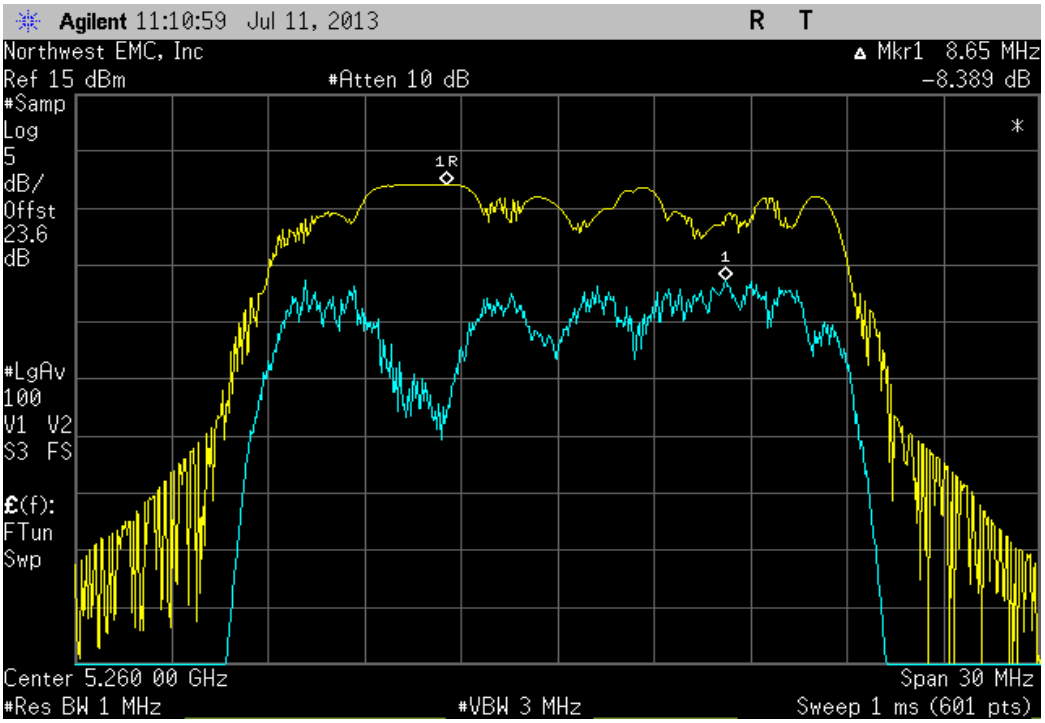


Peak Excursion of the Modulation Envelope - Antenna A

20 MHz, 802.11(n) MCS7, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				8.412 dB	≤ 13 dB	Pass



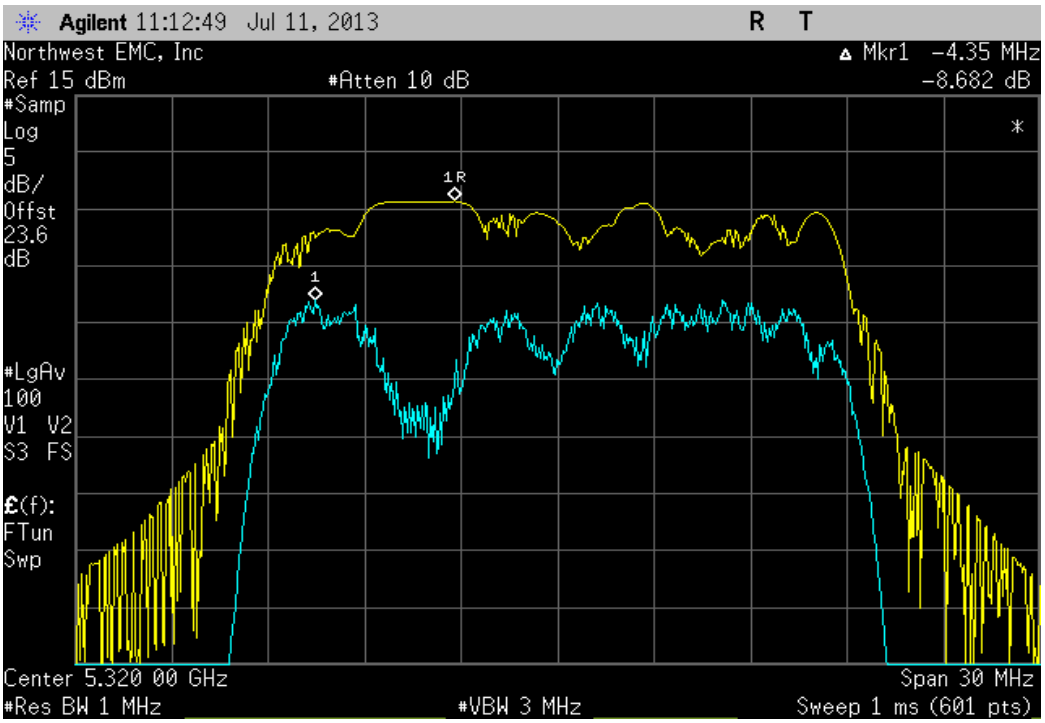
20 MHz, 802.11(n) MCS7, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				8.389 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope - Antenna A

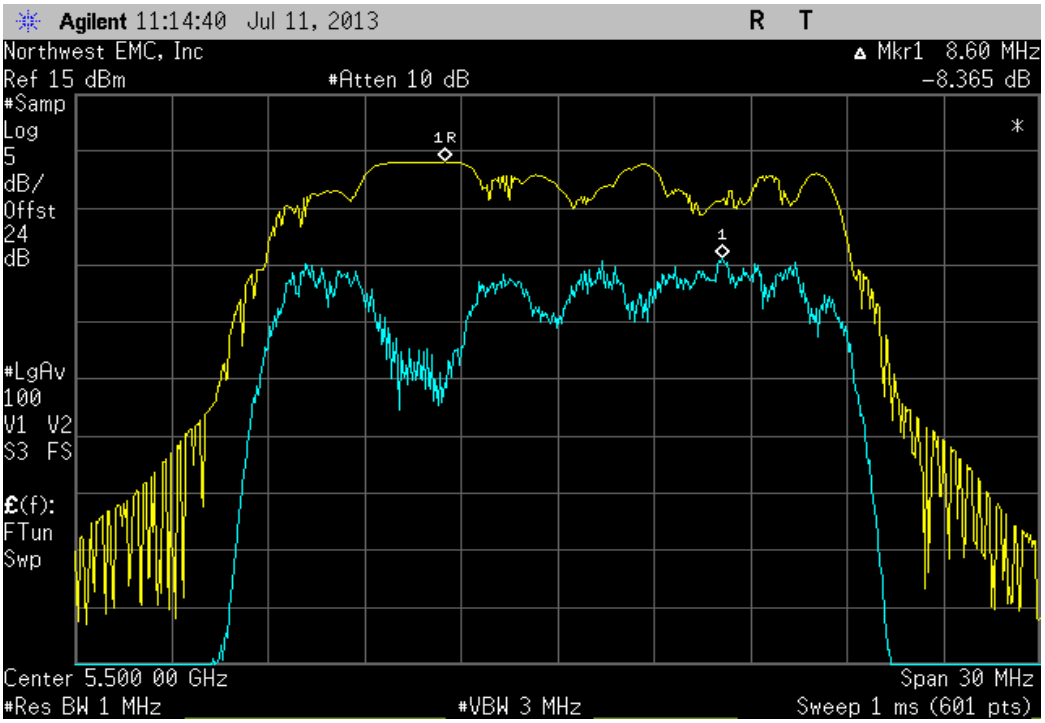
20 MHz, 802.11(n) MCS7, Ch 64, High Channel 5320 MHz

				Value	Limit	Result
				8.682 dB	≤ 13 dB	Pass



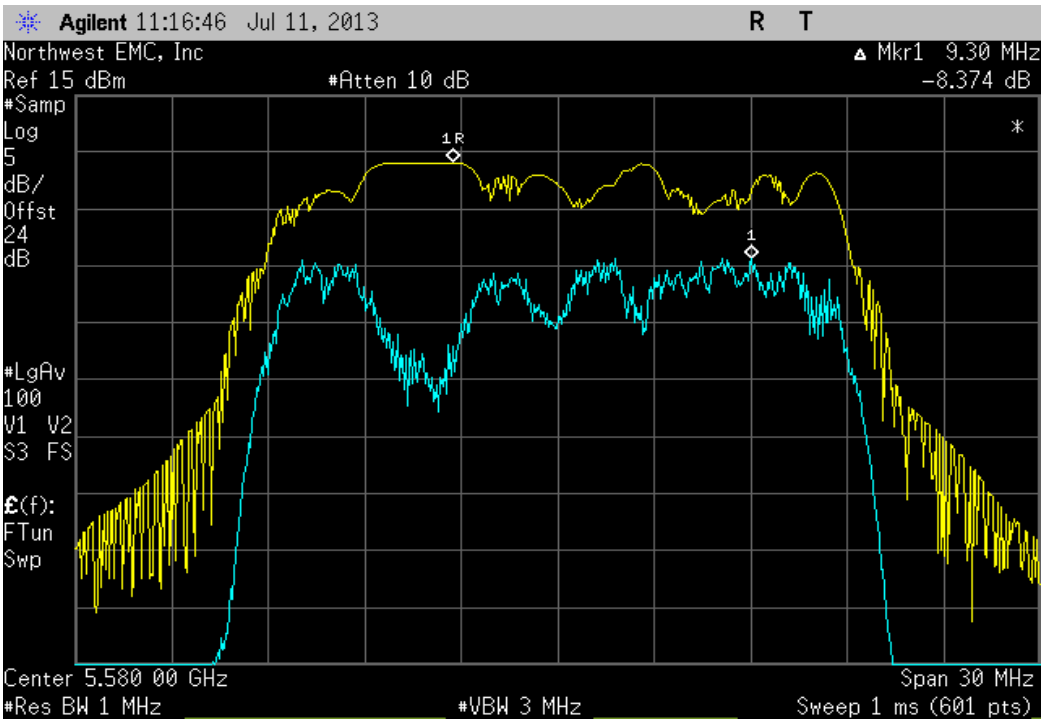
20 MHz, 802.11(n) MCS7, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				8.365 dB	≤ 13 dB	Pass

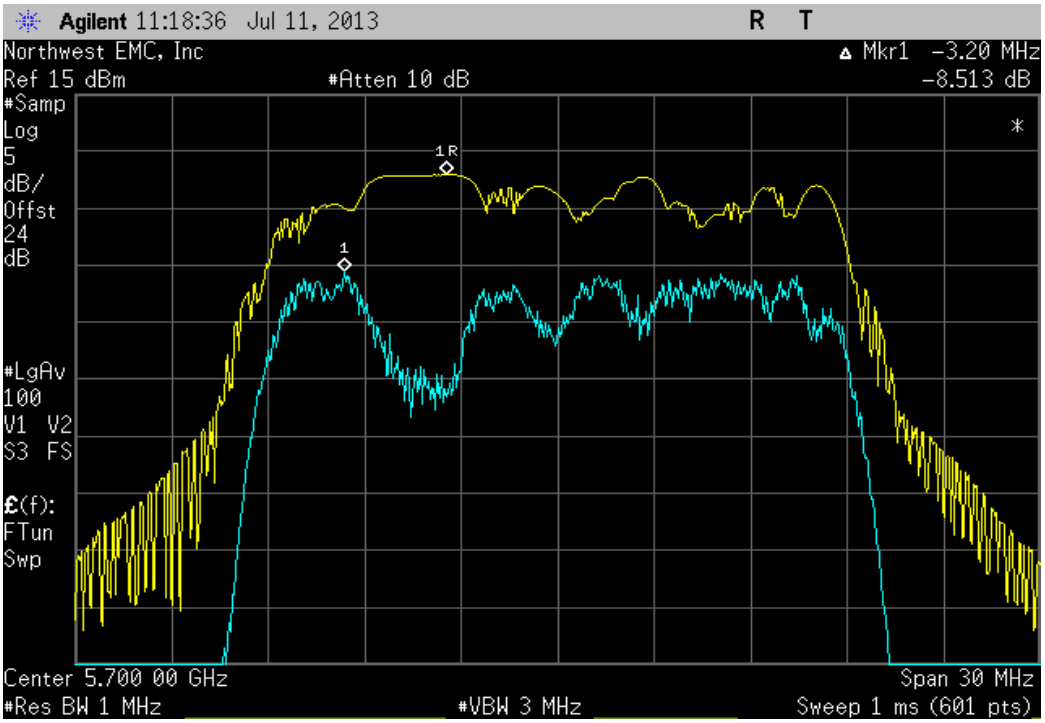


Peak Excursion of the Modulation Envelope - Antenna A

20 MHz, 802.11(n) MCS7, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				8.374 dB	≤ 13 dB	Pass



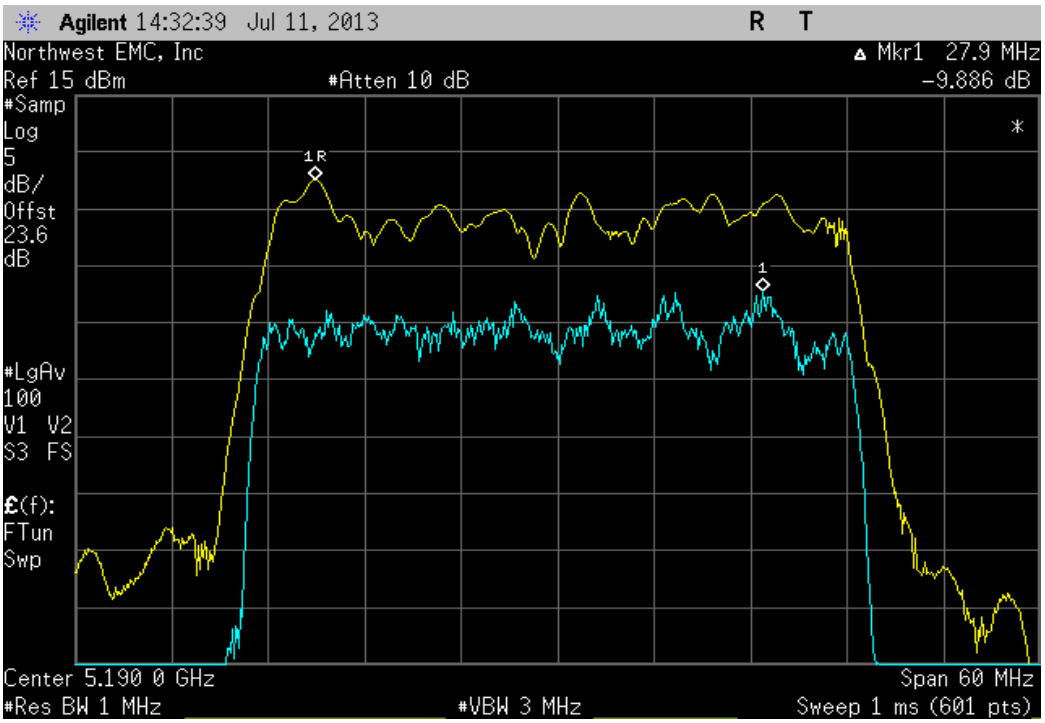
20 MHz, 802.11(n) MCS7, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				8.513 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope - Antenna A

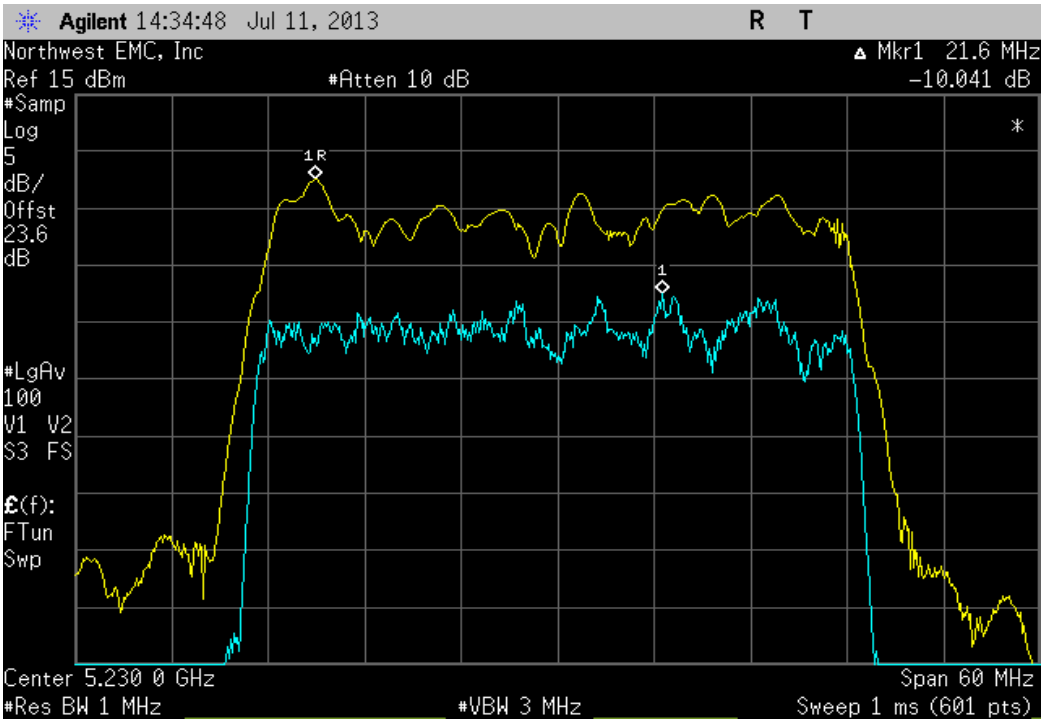
40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz

				Value	Limit	Result
				9.886 dB	≤ 13 dB	Pass

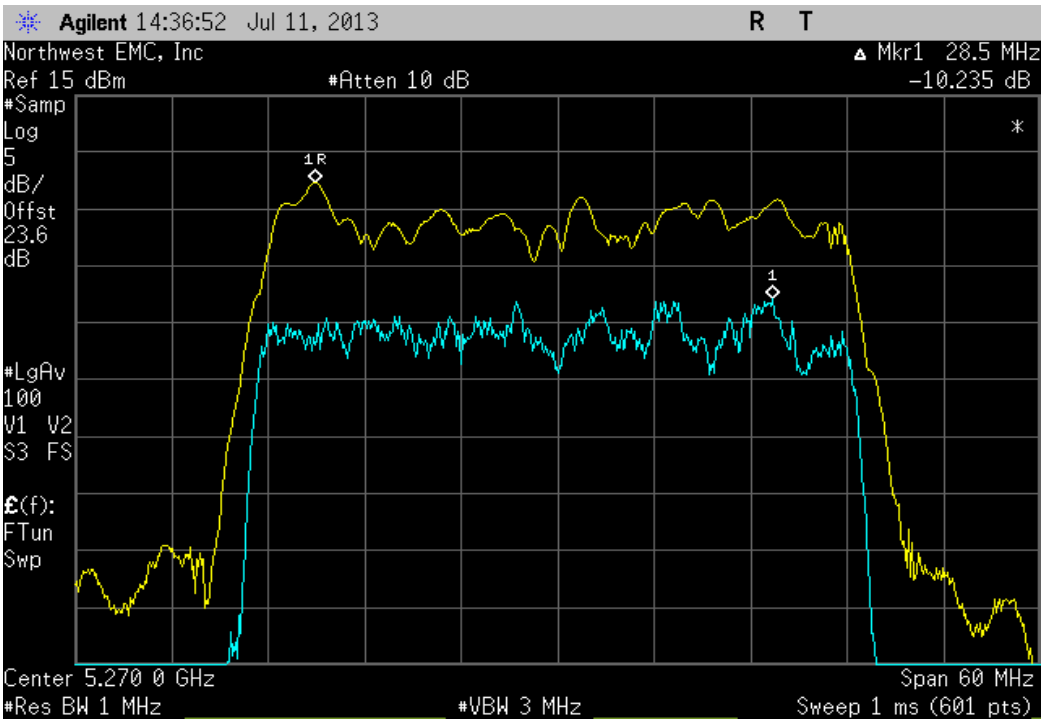


40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz

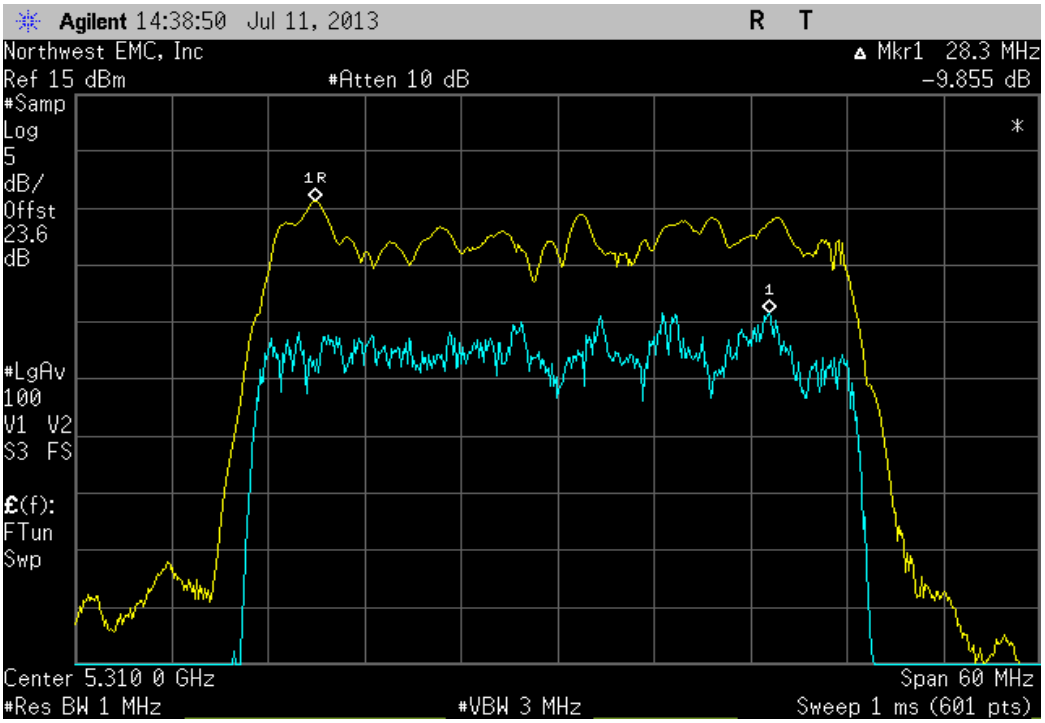
				Value	Limit	Result
				10.041 dB	≤ 13 dB	Pass



40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	Result
				10.235 dB	≤ 13 dB	Pass

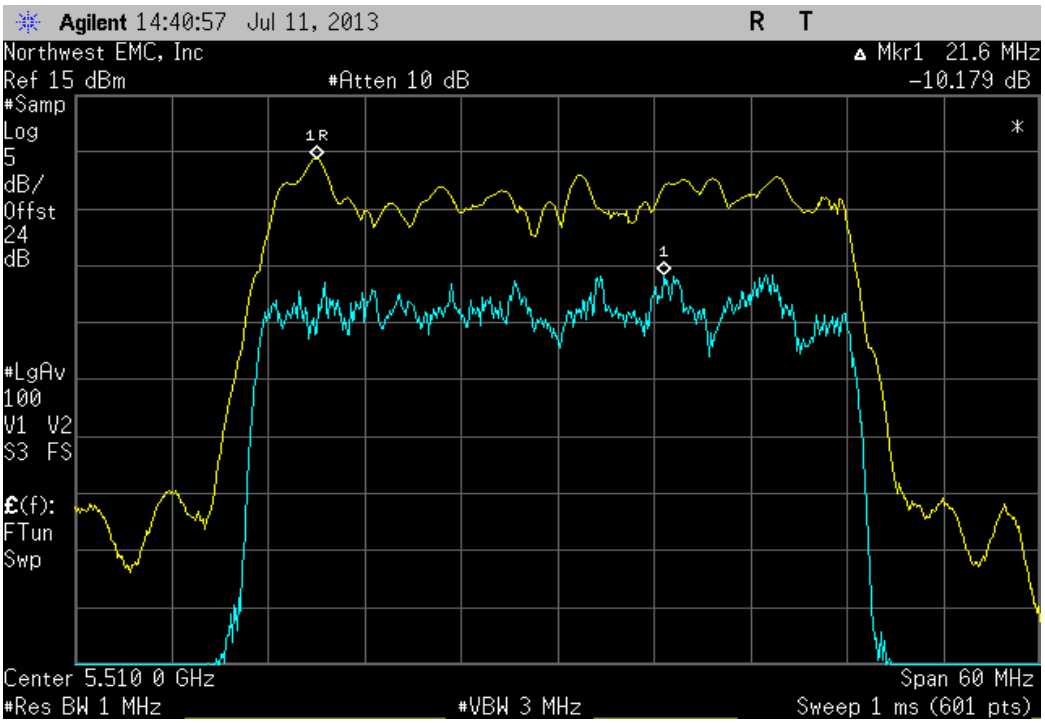


40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	Result
				9.855 dB	≤ 13 dB	Pass

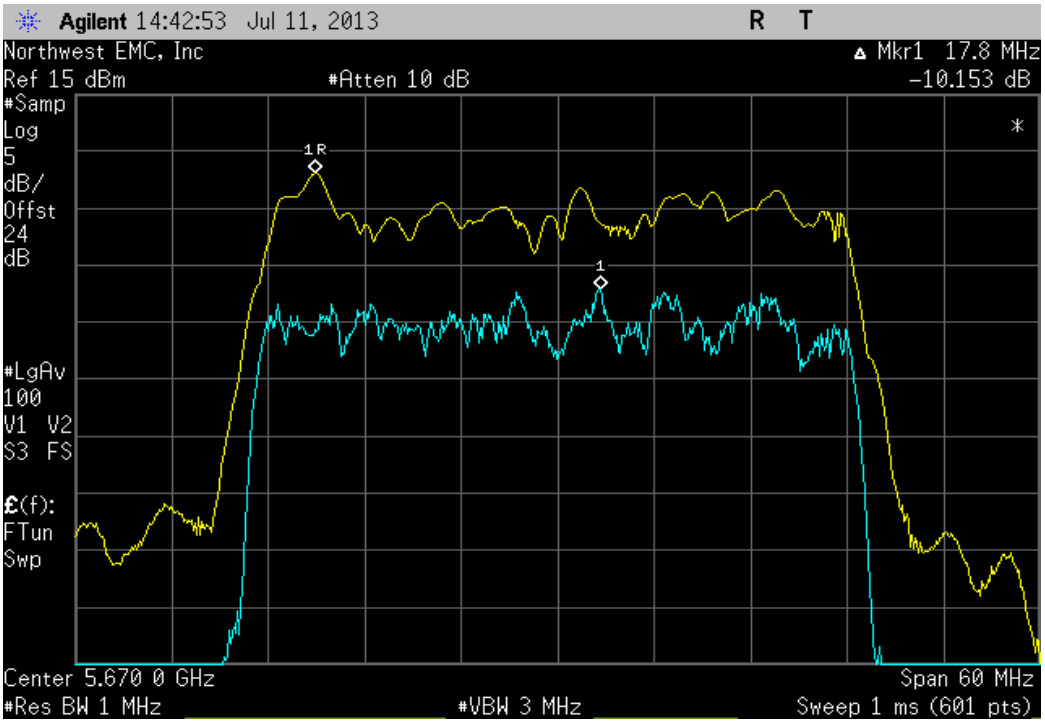


Peak Excursion of the Modulation Envelope - Antenna A

40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz						
				Value	Limit	Result
				10.179 dB	≤ 13 dB	Pass



40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz						
				Value	Limit	Result
				10.153 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

- 1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold..
- 2nd Trace: The same procedure and settings as was used for peak power spectral density

A DC block was used in-line for all measurements. The EUT was set to an output power of 12 dBm for all channels.

Peak Excursion of the Modulation Envelope-Antenna B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	07/11/13
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	43%
Project:	None	Barometric Pres.:	1018 mb
Tested by:	Brandon Hobbs, Richard Mellroth	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset. The modulation that produced the highest conducted output power for (a) and (n) modes for each chain was tested for each channel.

DEVIATIONS FROM TEST STANDARD

None

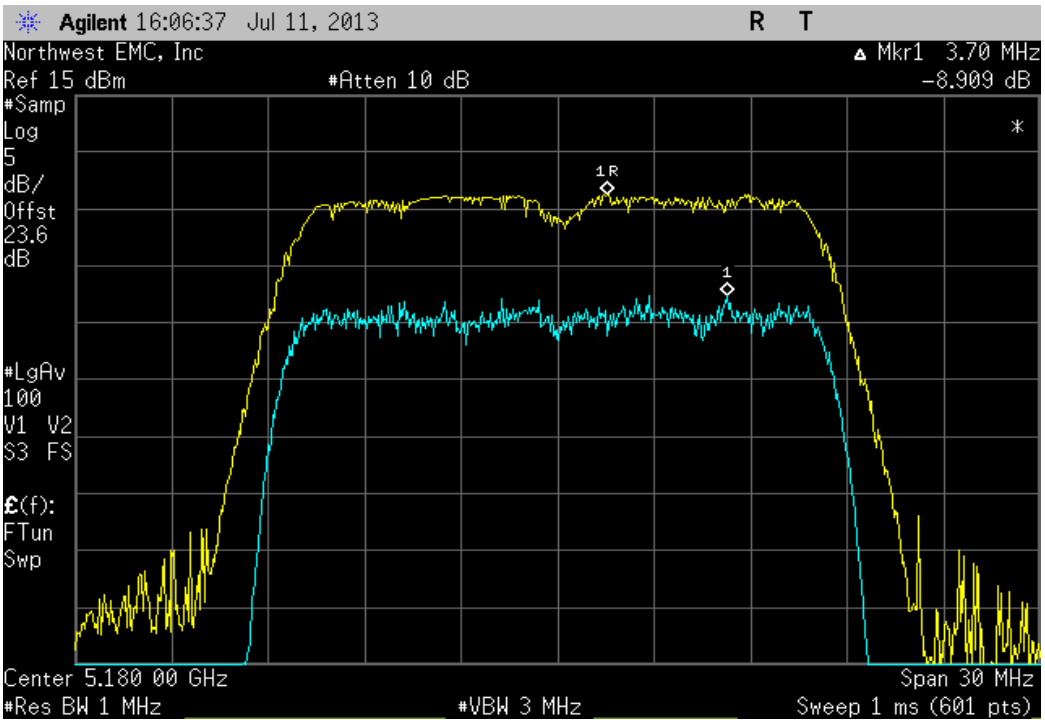
Configuration #	1	Signature

		Value	Limit	Result
20 MHz				
	802.11(a) 6 Mbps			
	Ch 36, Low Channel 5180 MHz	8.909 dB	≤ 13 dB	Pass
	Ch 48, High Channel 5240 MHz	9.139 dB	≤ 13 dB	Pass
	Ch 52, Low Channel 5260 MHz	9.118 dB	≤ 13 dB	Pass
	Ch 64, High Channel 5320 MHz	9.071 dB	≤ 13 dB	Pass
	Ch 100, Low Channel 5500 MHz	9.096 dB	≤ 13 dB	Pass
	Ch 116, Mid Channel 5580 MHz	9.159 dB	≤ 13 dB	Pass
	Ch 140, High Channel 5700 MHz	9.038 dB	≤ 13 dB	Pass
	802.11(n) MCS0			
	Ch 36, Low Channel 5180 MHz	8.479 dB	≤ 13 dB	Pass
	Ch 48, High Channel 5240 MHz	8.159 dB	≤ 13 dB	Pass
	Ch 52, Low Channel 5260 MHz	8.363 dB	≤ 13 dB	Pass
	Ch 64, High Channel 5320 MHz	8.538 dB	≤ 13 dB	Pass
	Ch 100, Low Channel 5500 MHz	8.313 dB	≤ 13 dB	Pass
	Ch 116, Mid Channel 5580 MHz	8.591 dB	≤ 13 dB	Pass
	Ch 140, High Channel 5700 MHz	8.648 dB	≤ 13 dB	Pass
40 MHz				
	802.11(n) MCS7			
	Ch 36/40, Low Channel 5190 MHz	8.888 dB	≤ 13 dB	Pass
	Ch 44/48, High Channel 5230 MHz	9.026 dB	≤ 13 dB	Pass
	Ch 52/56, Low Channel 5270 MHz	9.52 dB	≤ 13 dB	Pass
	Ch 60/64, High Channel 5310 MHz	9.445 dB	≤ 13 dB	Pass
	Ch 100/104, Low Channel 5510 MHz	9.944 dB	≤ 13 dB	Pass
	Ch 132/136, High Channel 5670 MHz	9.937 dB	≤ 13 dB	Pass

Peak Excursion of the Modulation Envelope-Antenna B

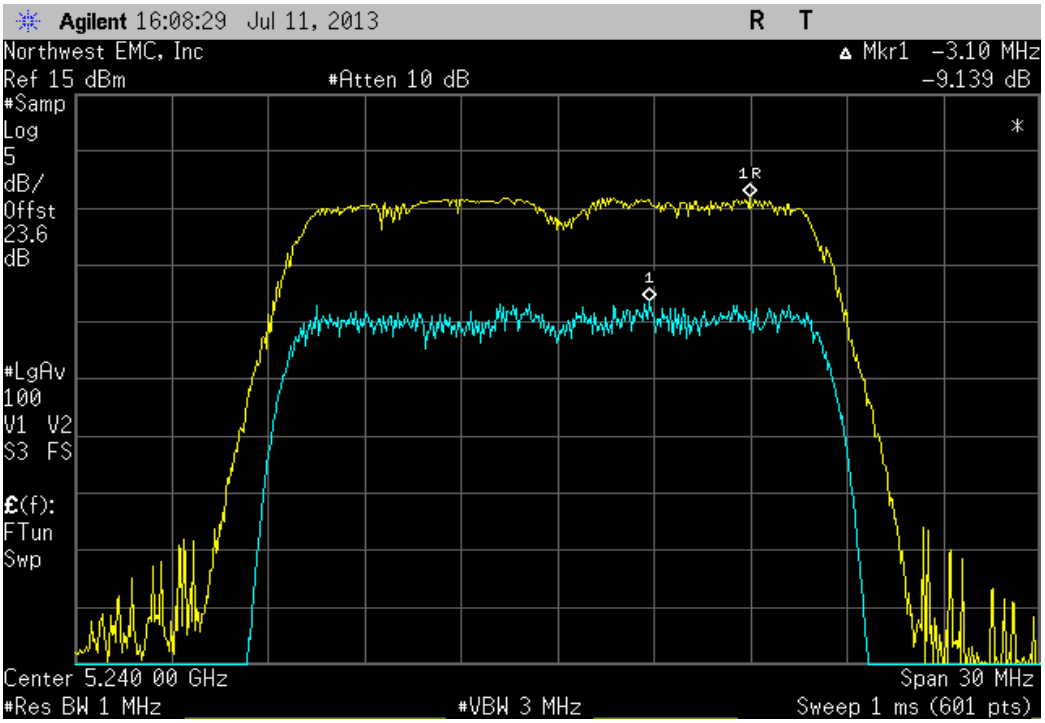
20 MHz, 802.11(a) 6 Mbps, Ch 36, Low Channel 5180 MHz

				Value	Limit	Result
				8.909 dB	≤ 13 dB	Pass



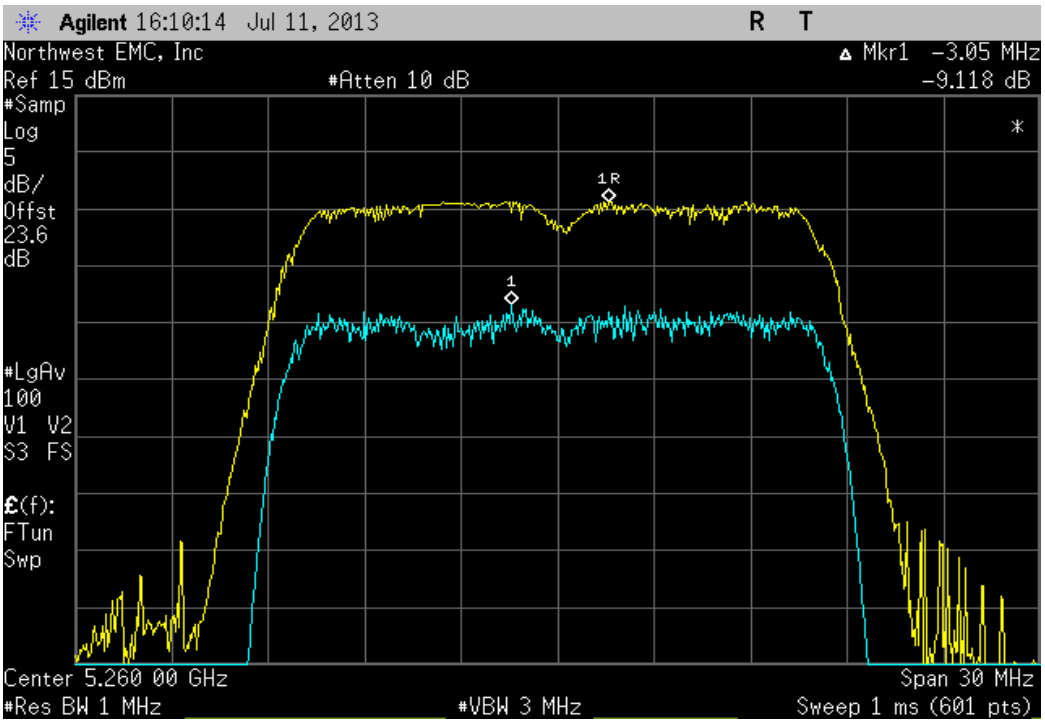
20 MHz, 802.11(a) 6 Mbps, Ch 48, High Channel 5240 MHz

				Value	Limit	Result
				9.139 dB	≤ 13 dB	Pass

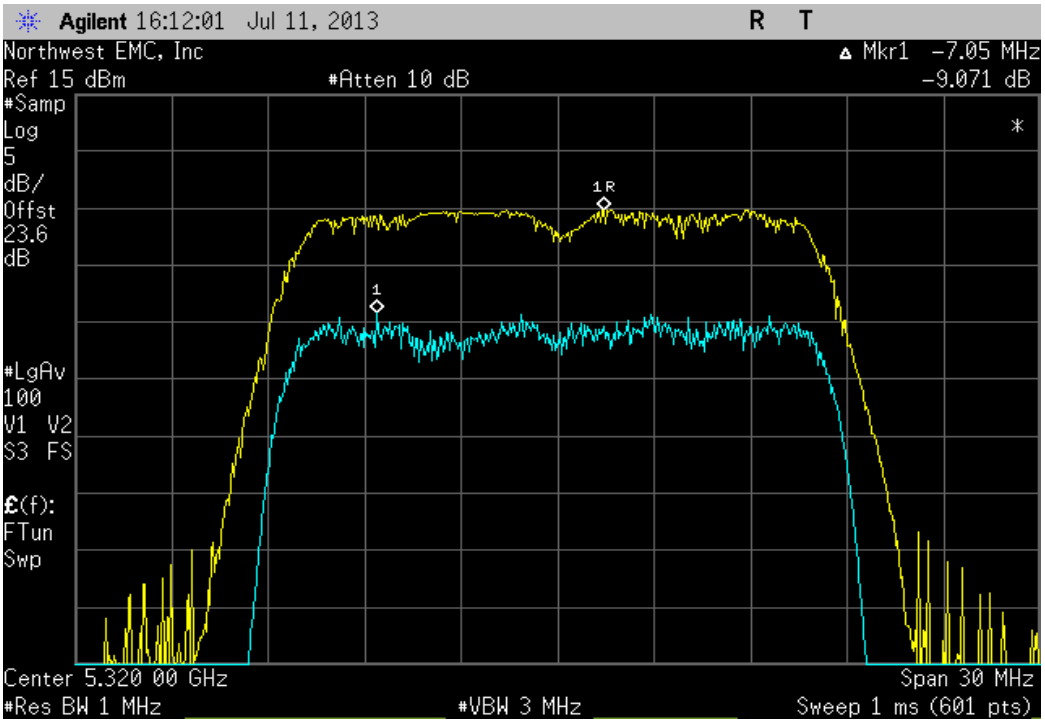


Peak Excursion of the Modulation Envelope-Antenna B

20 MHz, 802.11(a) 6 Mbps, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				9.118 dB	≤ 13 dB	Pass



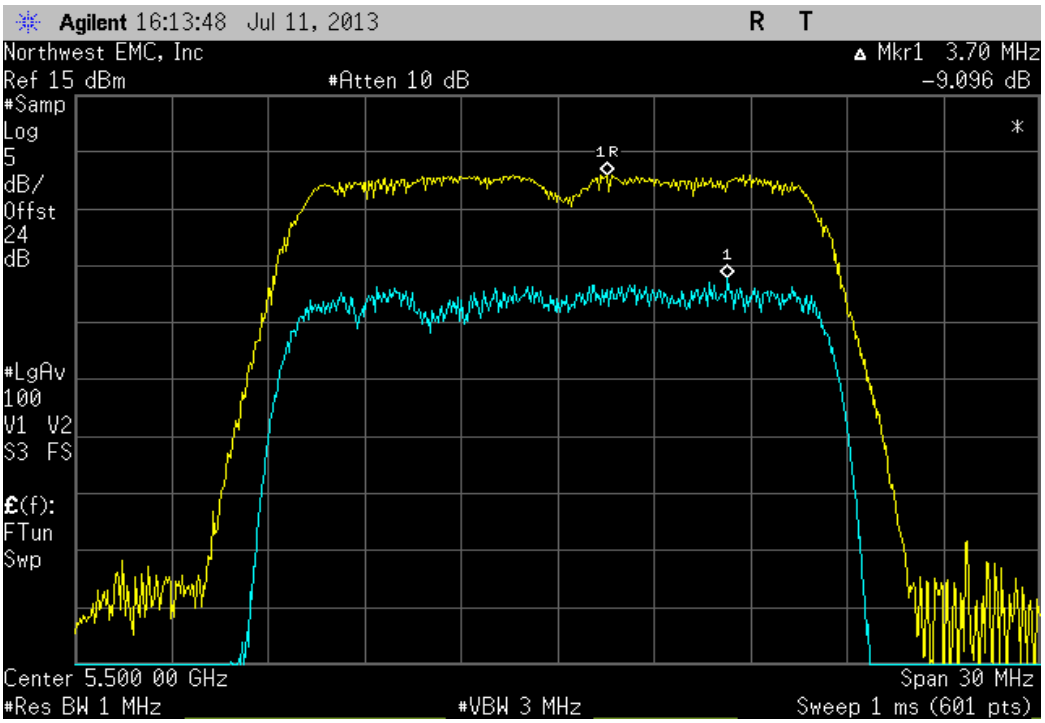
20 MHz, 802.11(a) 6 Mbps, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				9.071 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna B

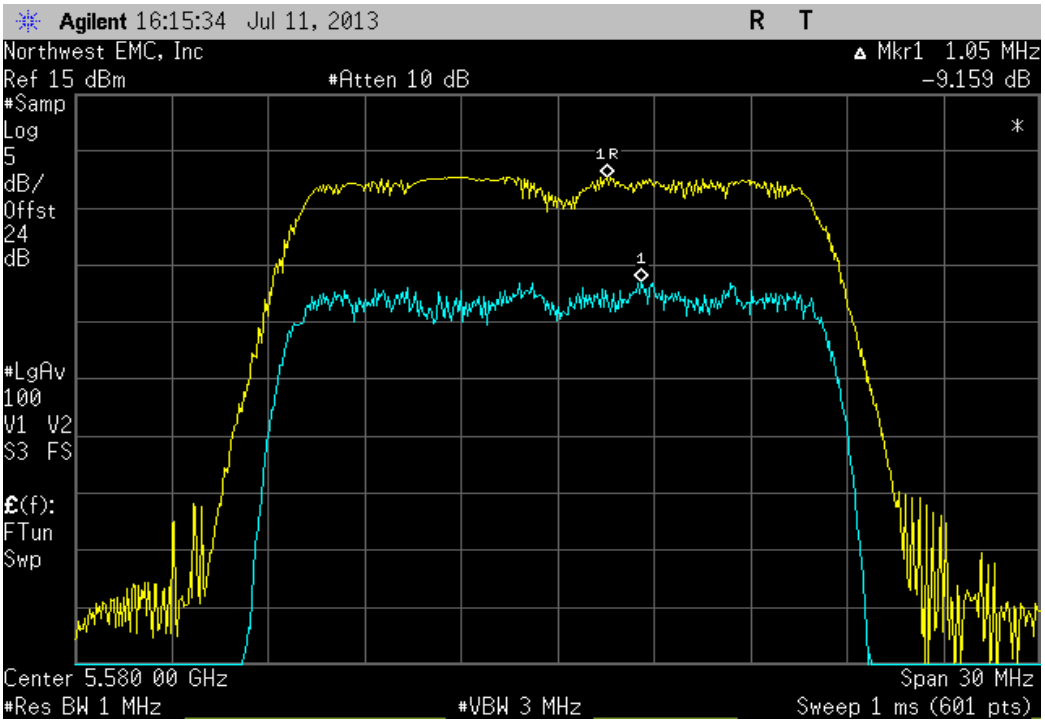
20 MHz, 802.11(a) 6 Mbps, Ch 100, Low Channel 5500 MHz

				Value	Limit	Result
				9.096 dB	≤ 13 dB	Pass



20 MHz, 802.11(a) 6 Mbps, Ch 116, Mid Channel 5580 MHz

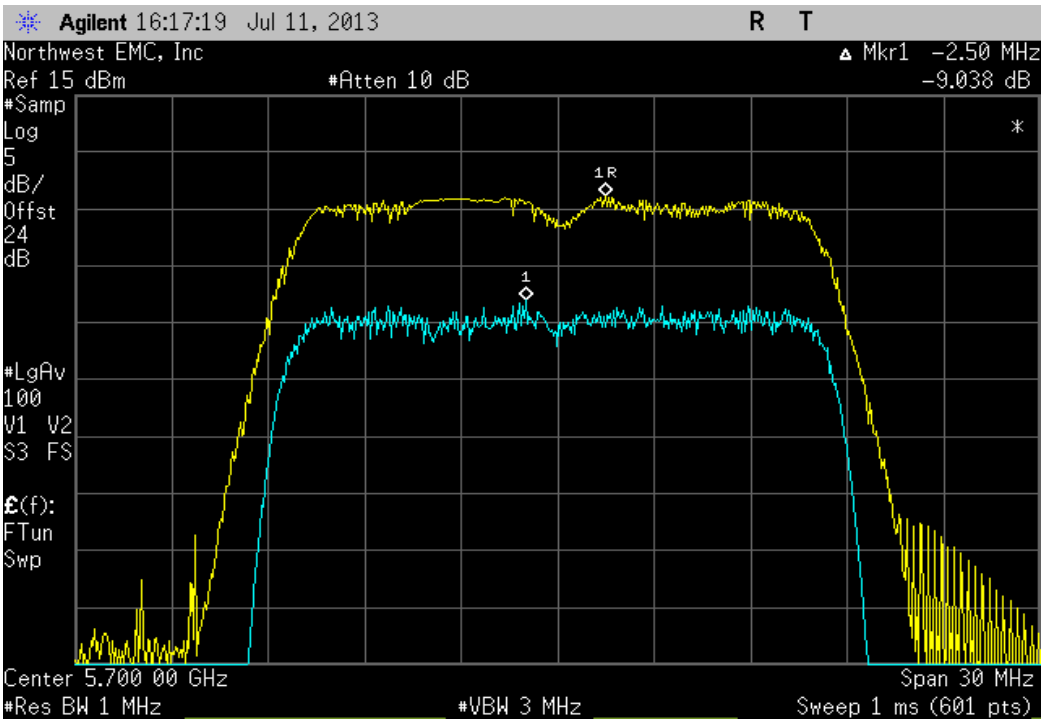
				Value	Limit	Result
				9.159 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna B

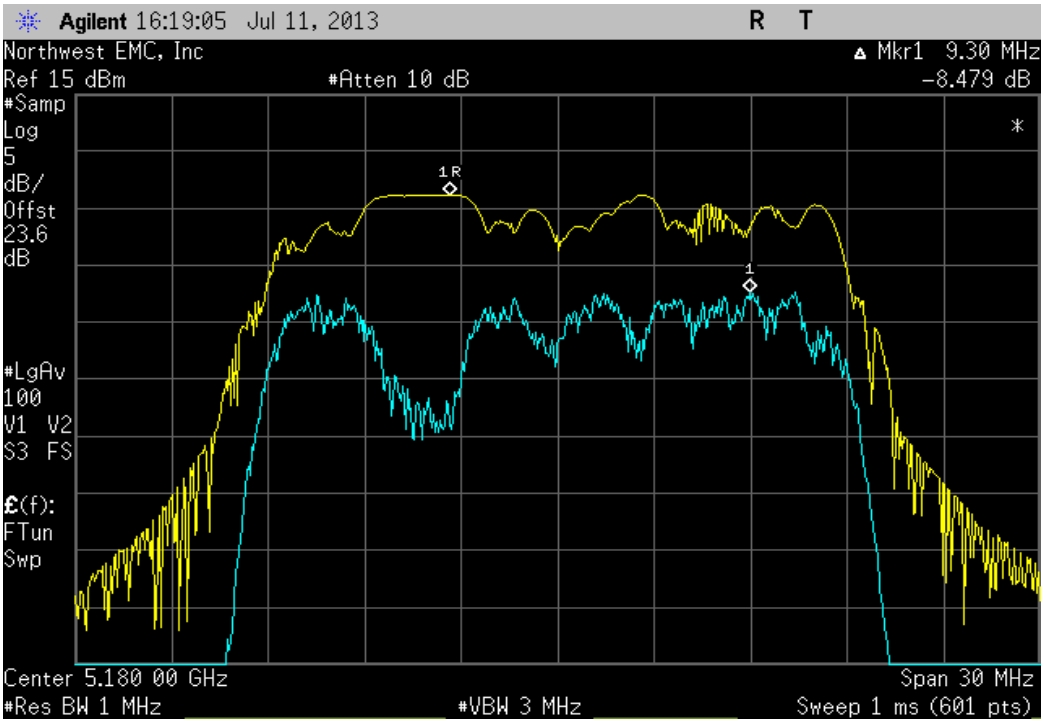
20 MHz, 802.11(a) 6 Mbps, Ch 140, High Channel 5700 MHz

				Value	Limit	Result
				9.038 dB	≤ 13 dB	Pass

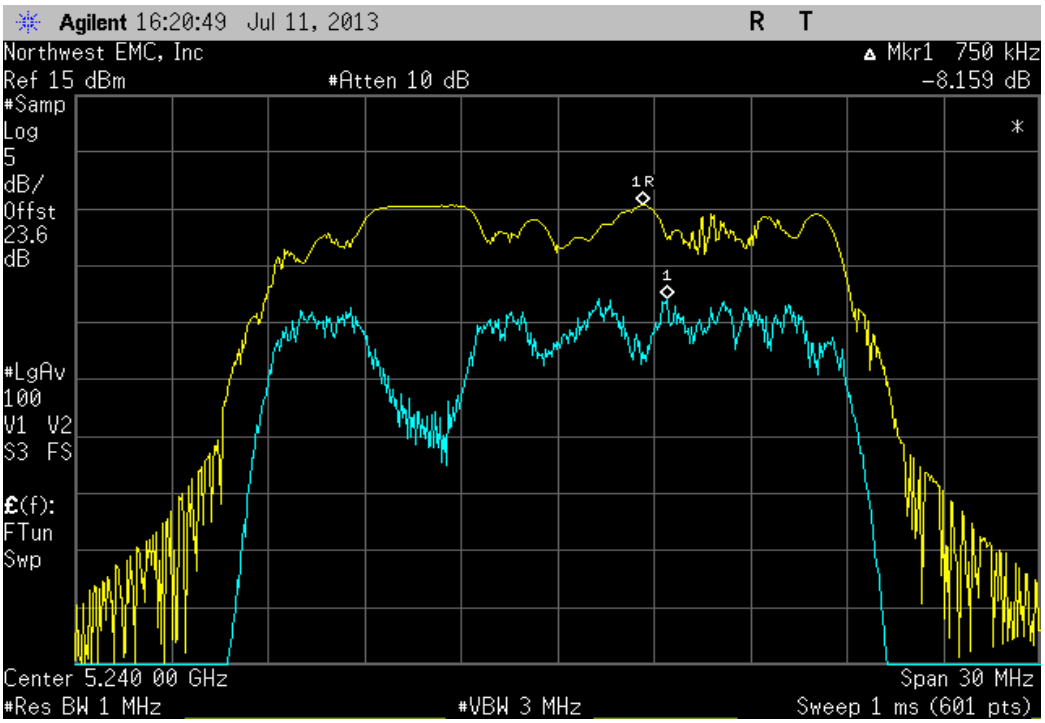


20 MHz, 802.11(n) MCS0, Ch 36, Low Channel 5180 MHz

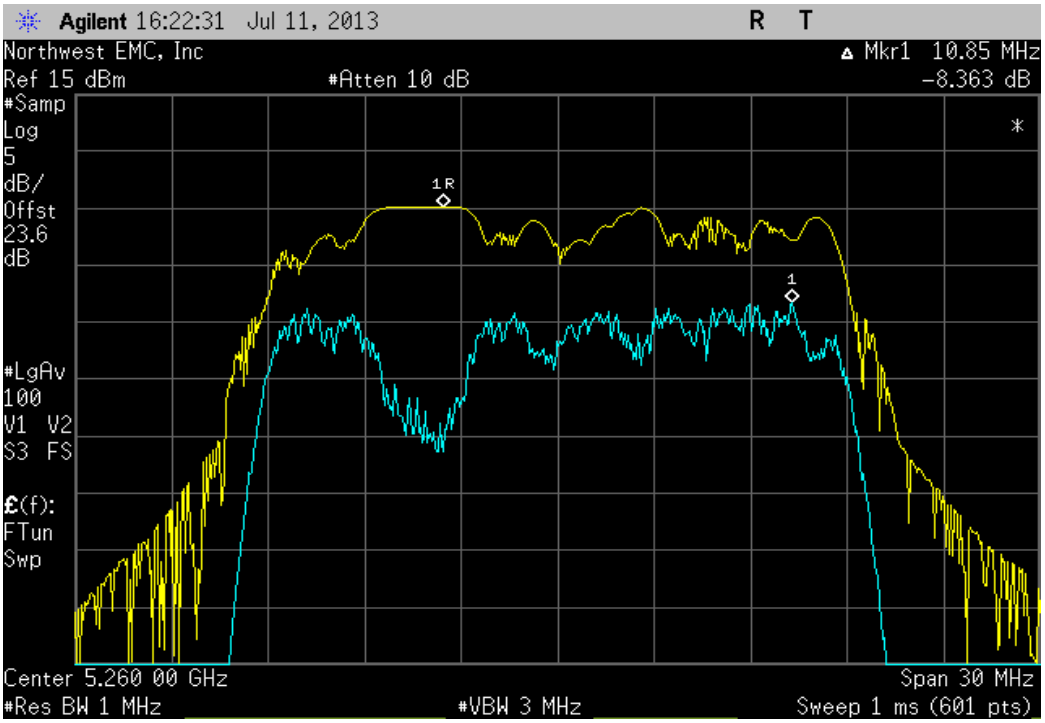
				Value	Limit	Result
				8.479 dB	≤ 13 dB	Pass



20 MHz, 802.11(n) MCS0, Ch 48, High Channel 5240 MHz						
				Value	Limit	Result
				8.159 dB	≤ 13 dB	Pass

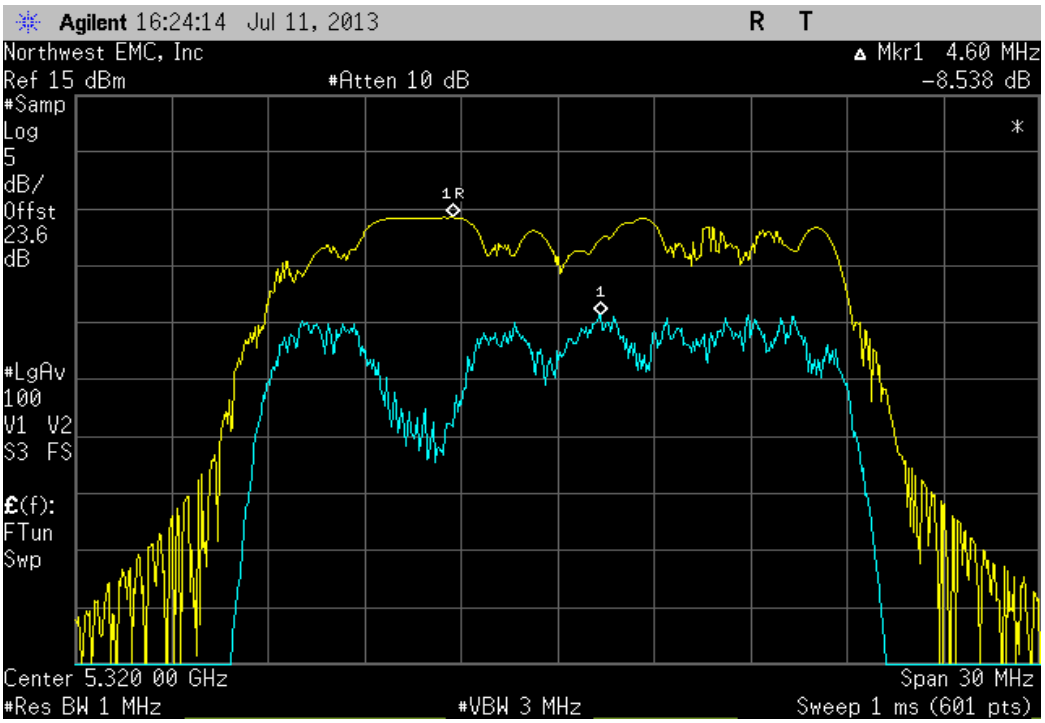


20 MHz, 802.11(n) MCS0, Ch 52, Low Channel 5260 MHz						
				Value	Limit	Result
				8.363 dB	≤ 13 dB	Pass

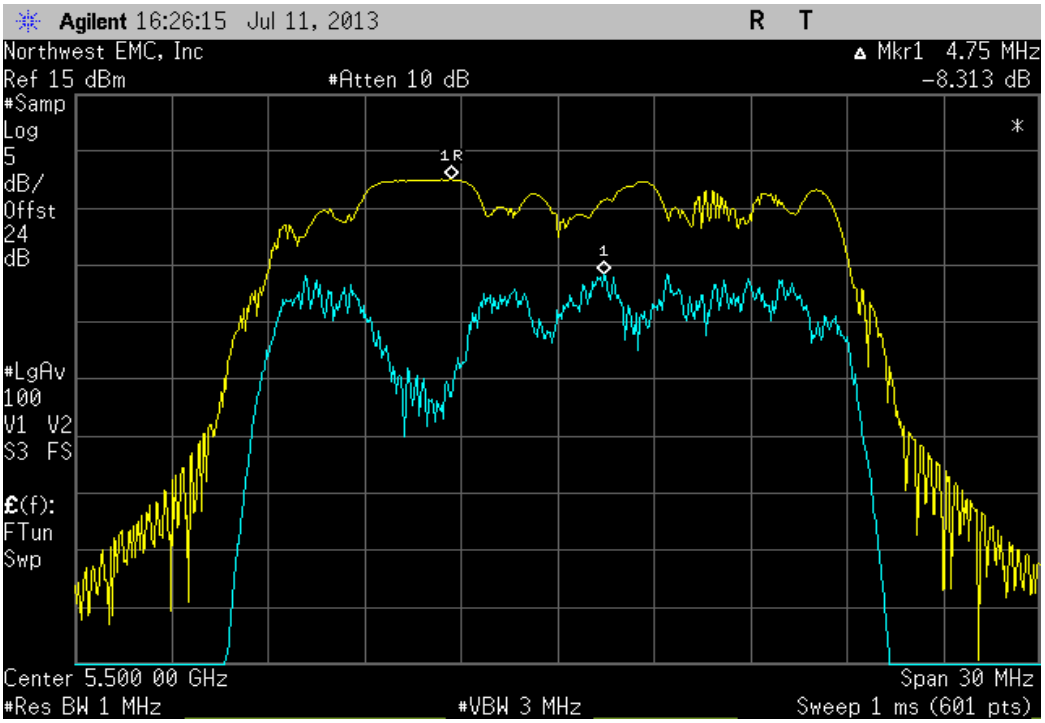


Peak Excursion of the Modulation Envelope-Antenna B

20 MHz, 802.11(n) MCS0, Ch 64, High Channel 5320 MHz						
				Value	Limit	Result
				8.538 dB	≤ 13 dB	Pass

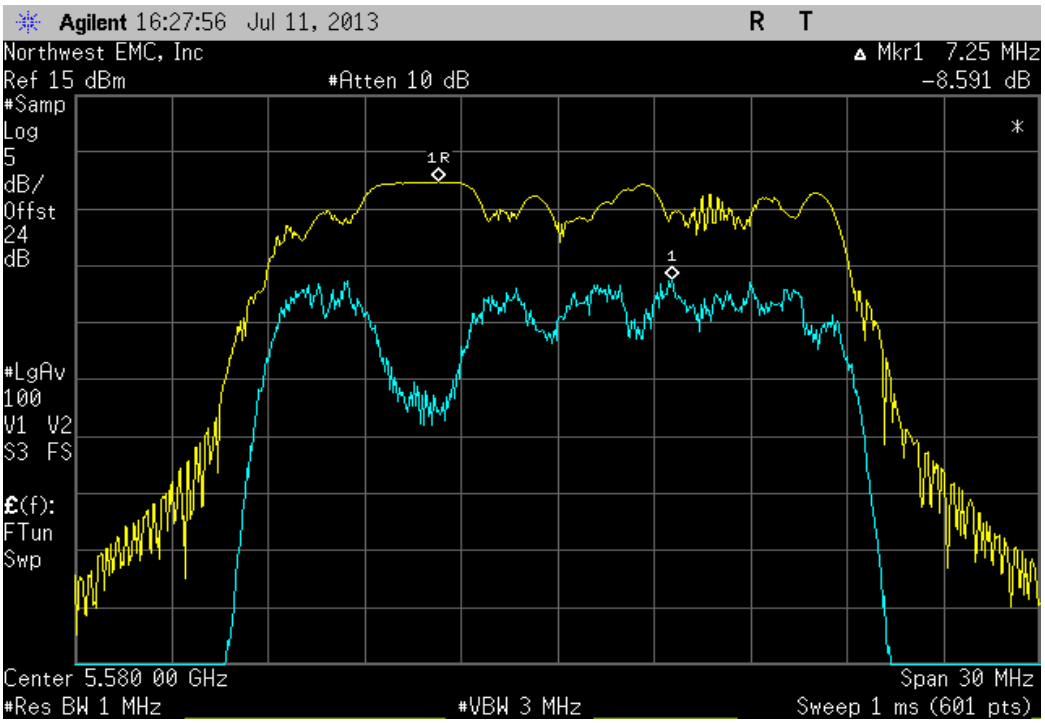


20 MHz, 802.11(n) MCS0, Ch 100, Low Channel 5500 MHz						
				Value	Limit	Result
				8.313 dB	≤ 13 dB	Pass

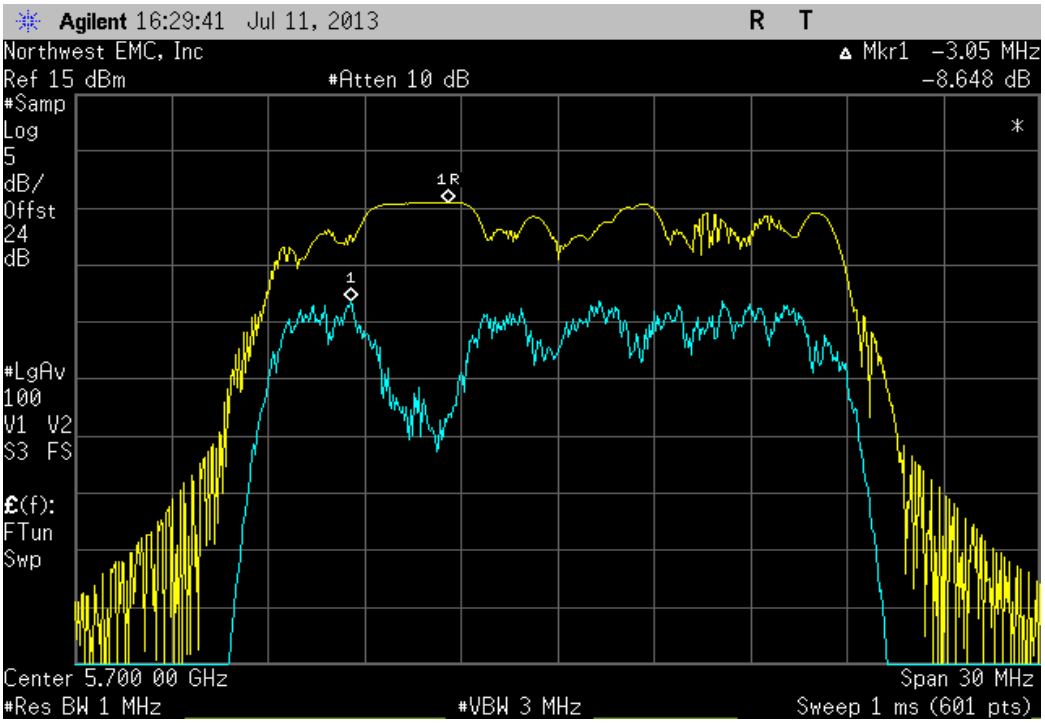


Peak Excursion of the Modulation Envelope-Antenna B

20 MHz, 802.11(n) MCS0, Ch 116, Mid Channel 5580 MHz						
				Value	Limit	Result
				8.591 dB	≤ 13 dB	Pass

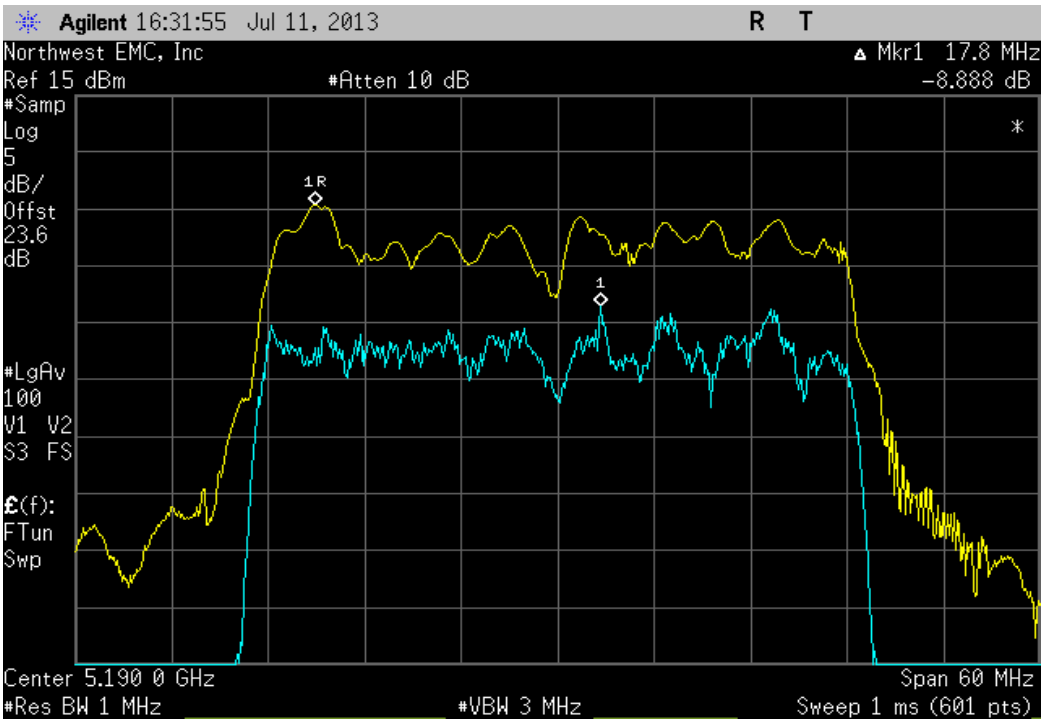


20 MHz, 802.11(n) MCS0, Ch 140, High Channel 5700 MHz						
				Value	Limit	Result
				8.648 dB	≤ 13 dB	Pass

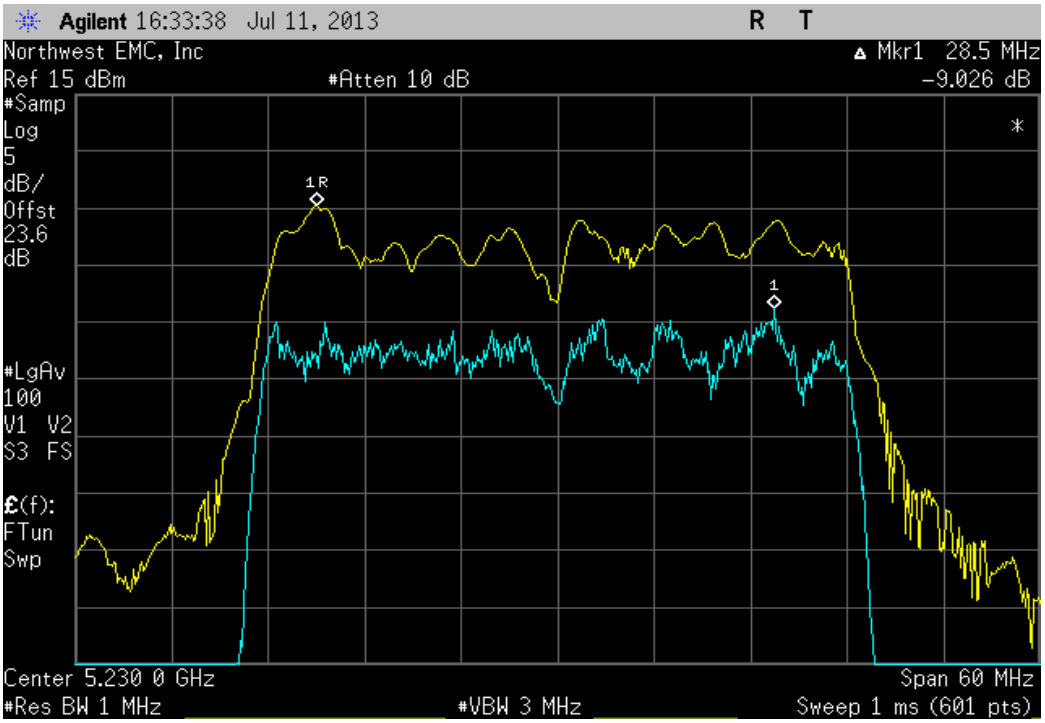


Peak Excursion of the Modulation Envelope-Antenna B

40 MHz, 802.11(n) MCS7, Ch 36/40, Low Channel 5190 MHz						
				Value	Limit	Result
				8.888 dB	≤ 13 dB	Pass

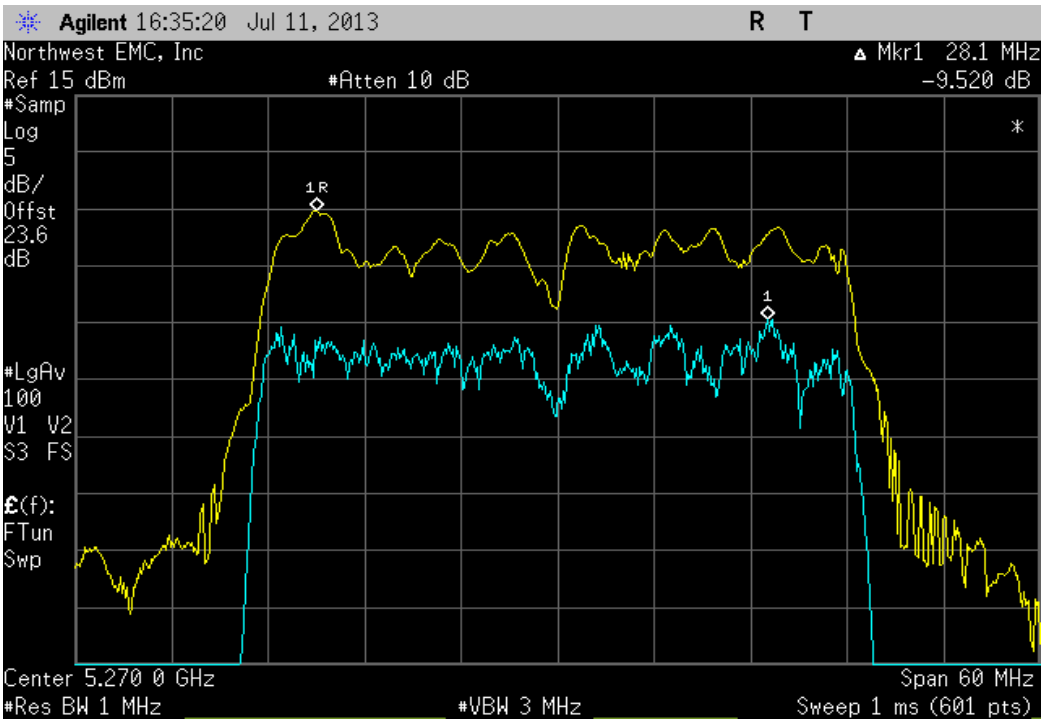


40 MHz, 802.11(n) MCS7, Ch 44/48, High Channel 5230 MHz						
				Value	Limit	Result
				9.026 dB	≤ 13 dB	Pass

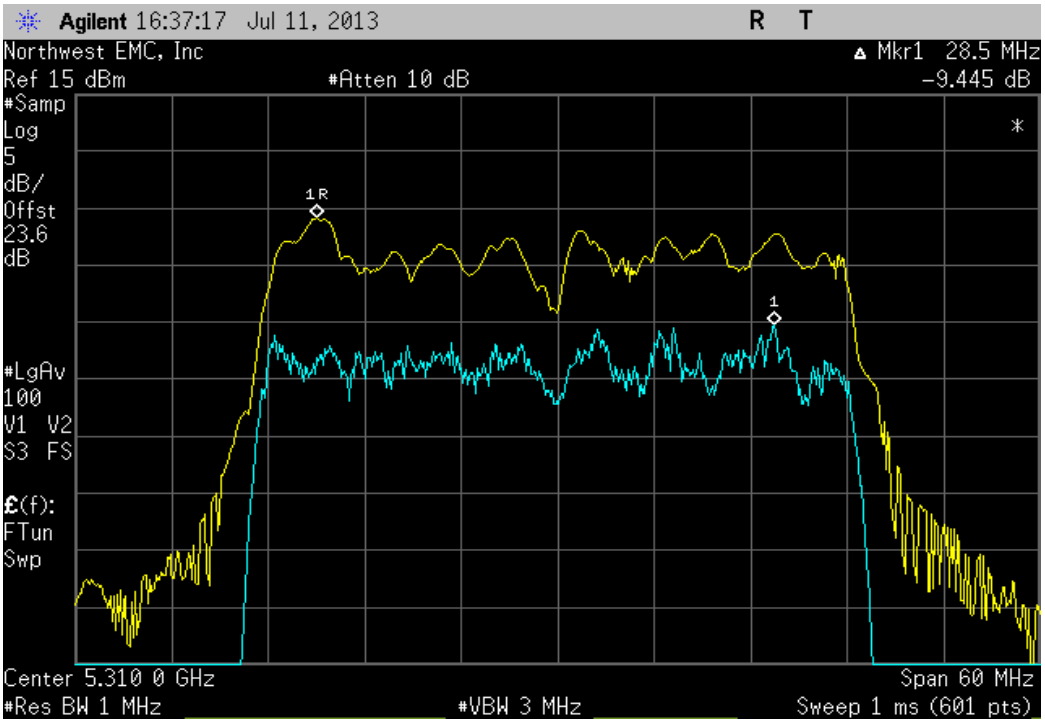


Peak Excursion of the Modulation Envelope-Antenna B

40 MHz, 802.11(n) MCS7, Ch 52/56, Low Channel 5270 MHz						
				Value	Limit	Result
				9.52 dB	≤ 13 dB	Pass



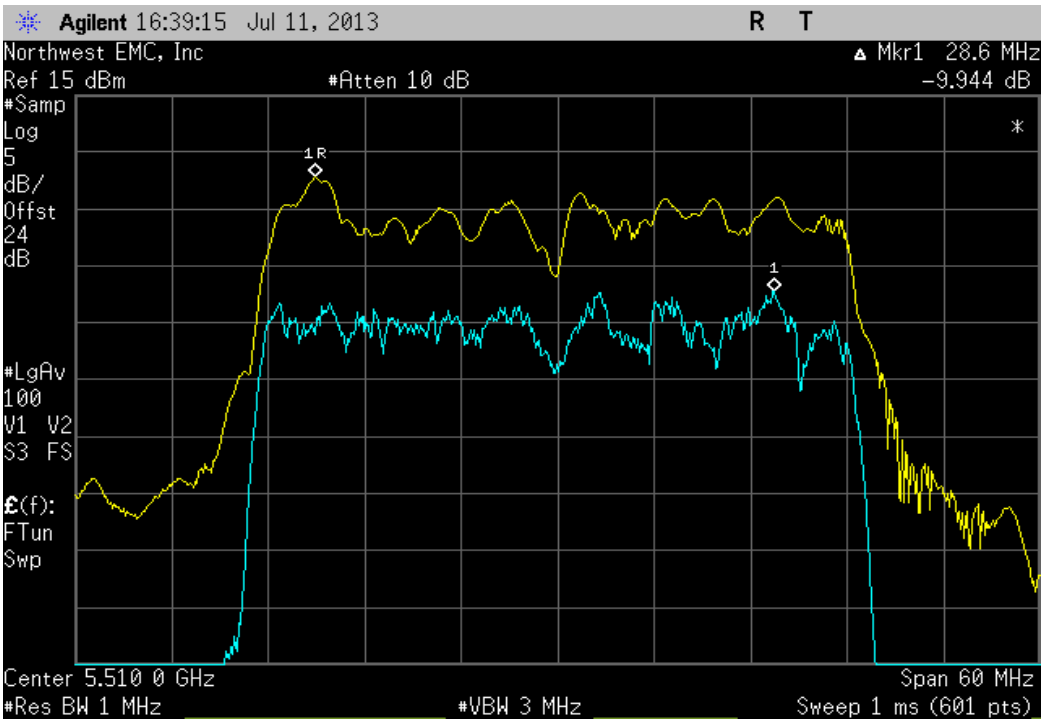
40 MHz, 802.11(n) MCS7, Ch 60/64, High Channel 5310 MHz						
				Value	Limit	Result
				9.445 dB	≤ 13 dB	Pass



Peak Excursion of the Modulation Envelope-Antenna B

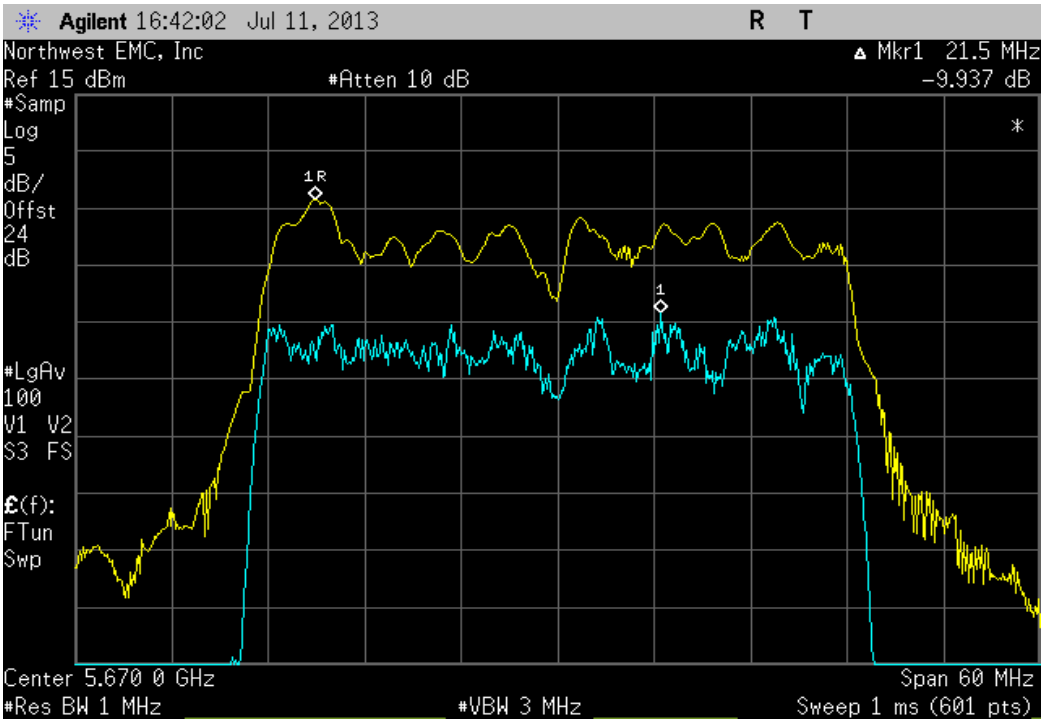
40 MHz, 802.11(n) MCS7, Ch 100/104, Low Channel 5510 MHz

				Value	Limit	Result
				9.944 dB	≤ 13 dB	Pass



40 MHz, 802.11(n) MCS7, Ch 132/136, High Channel 5670 MHz

				Value	Limit	Result
				9.937 dB	≤ 13 dB	Pass



Band Edge Compliance - Antenna A-B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge. A DC block was used in-line for all measurements. The EUT power level was set to 12 dBm for all channels.

Band Edge Compliance - Antenna A-B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	07/12/13
Customer:	Microsoft Corporation	Temperature:	23°C
Attendees:	None	Humidity:	42%
Project:	None	Barometric Pres.:	1017 mb
Tested by:	Brandon Hobbs, Richard Mellroth	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

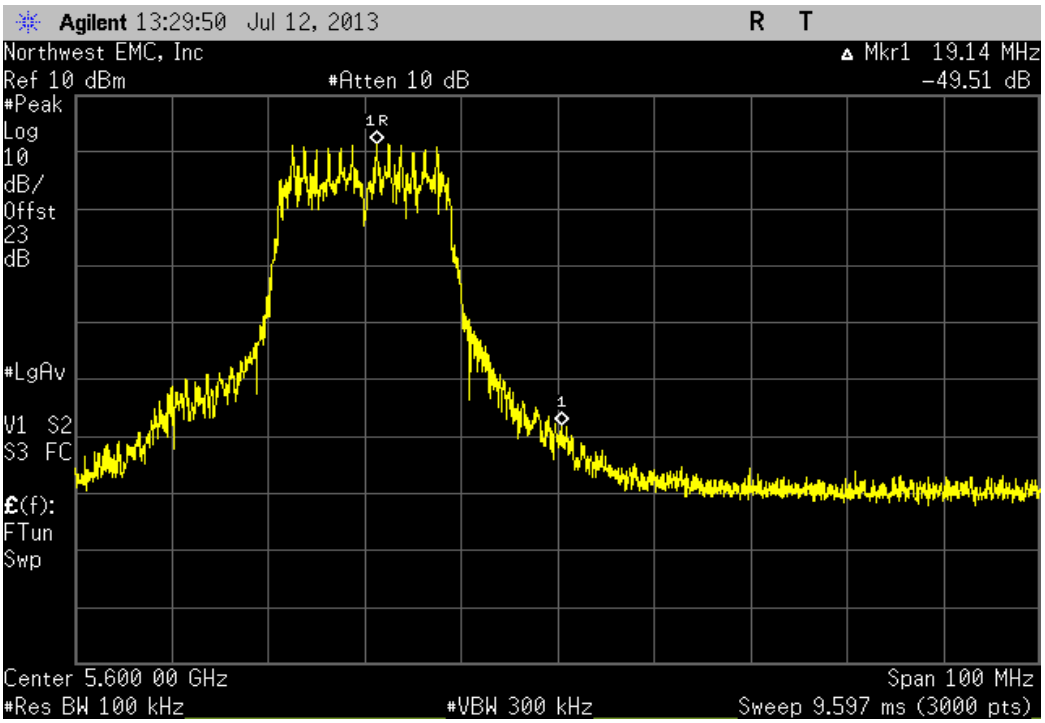
Configuration #	1	Signature

			Value	Limit	Result
Chain A					
	20 MHz				
		802.11(n) MCS8			
		Ch 116, High Channel 5580MHz	-49.51 dBc	≤ -20 dBc	Pass
		Ch 132, Low Channel 5660MHz	-26.22 dBc	≤ -20 dBc	Pass
		802.11(n) MCS15			
		Ch 116, High Channel 5580MHz	-49.49 dBc	≤ -20 dBc	Pass
		Ch 132, Low Channel 5660MHz	-26.22 dBc	≤ -20 dBc	Pass
Chain B					
	20 MHz				
		802.11(n) MCS8			
		Ch 116, High Channel 5580MHz	-48.39 dBc	≤ -20 dBc	Pass
		Ch 132, Low Channel 5660MHz	-22.19 dBc	≤ -20 dBc	Pass
		802.11(n) MCS15			
		Ch 116, High Channel 5580MHz	-49.1 dBc	≤ -20 dBc	Pass
		Ch 132, Low Channel 5660MHz	-22.4 dBc	≤ -20 dBc	Pass

Band Edge Compliance - Antenna A-B

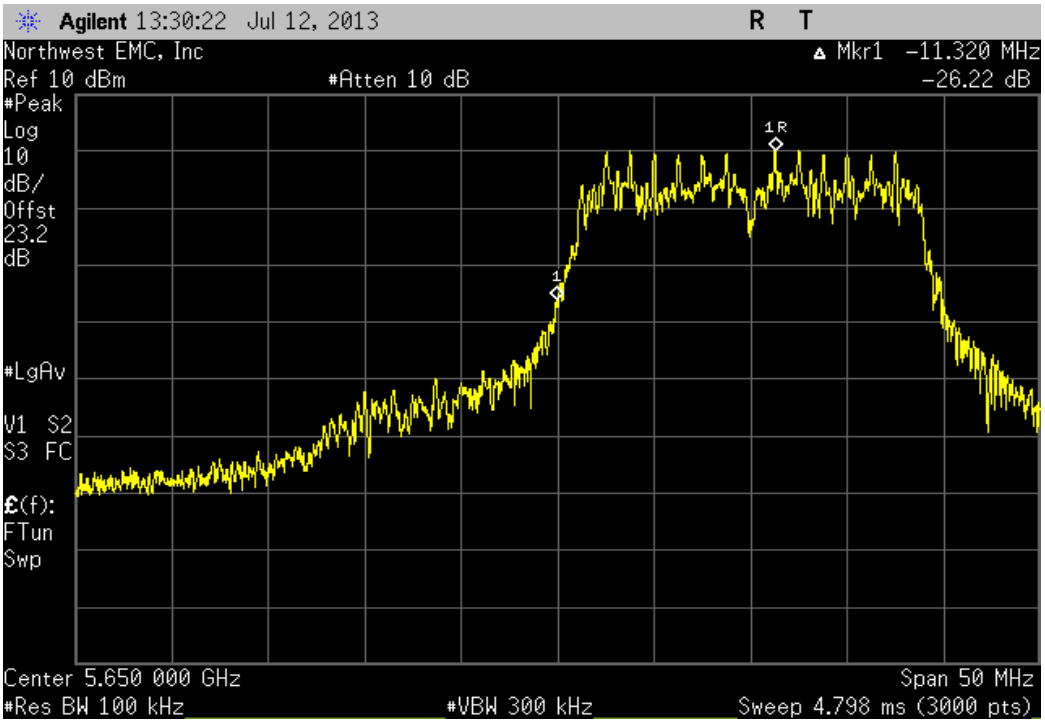
Chain A, 20 MHz, 802.11(n) MCS8, Ch 116, High Channel 5580MHz

				Value	Limit	Result
				-49.51 dBc	≤ -20 dBc	Pass



Chain A, 20 MHz, 802.11(n) MCS8, Ch 132, Low Channel 5660MHz

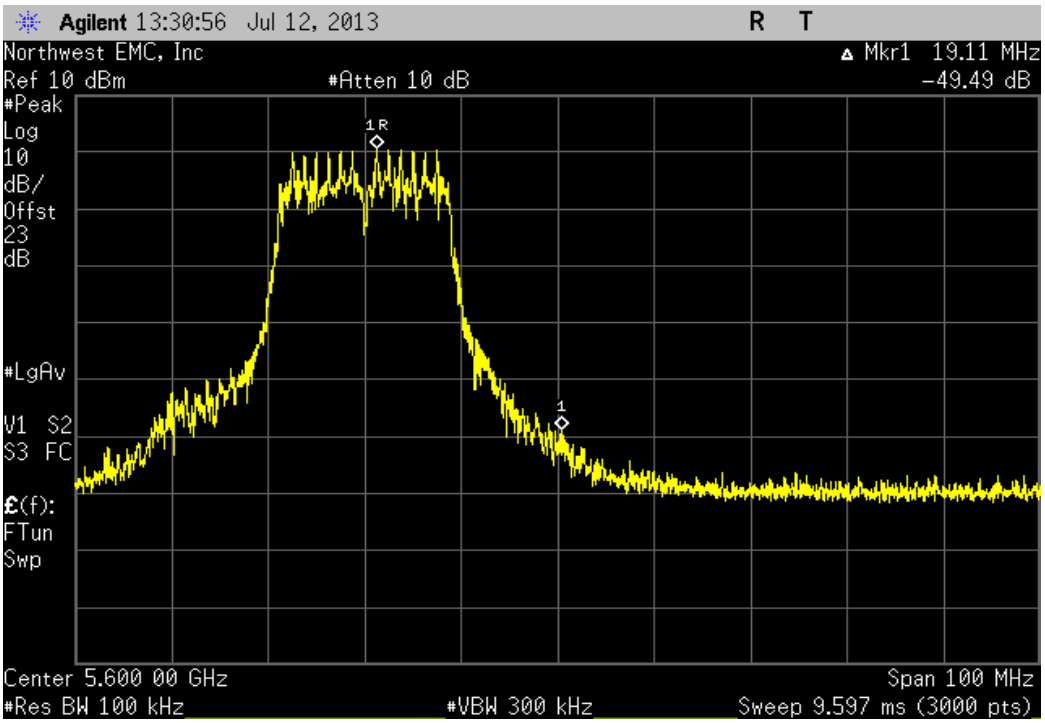
				Value	Limit	Result
				-26.22 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A-B

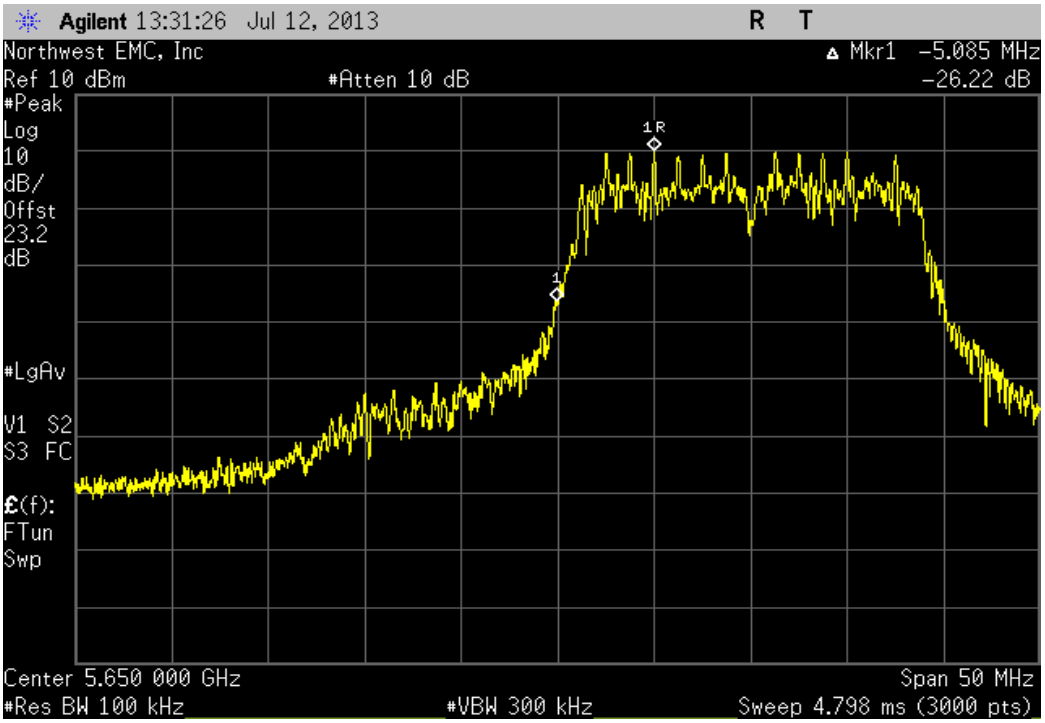
Chain A, 20 MHz, 802.11(n) MCS15, Ch 116, High Channel 5580MHz

				Value	Limit	Result
				-49.49 dBc	≤ -20 dBc	Pass



Chain A, 20 MHz, 802.11(n) MCS15, Ch 132, Low Channel 5660MHz

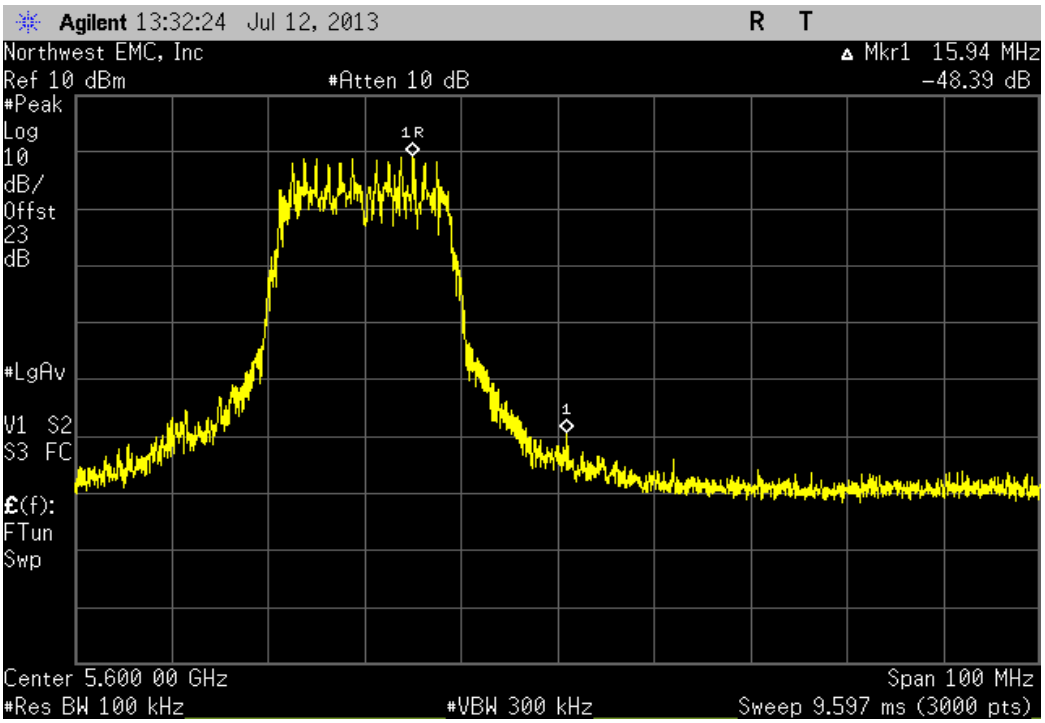
				Value	Limit	Result
				-26.22 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A-B

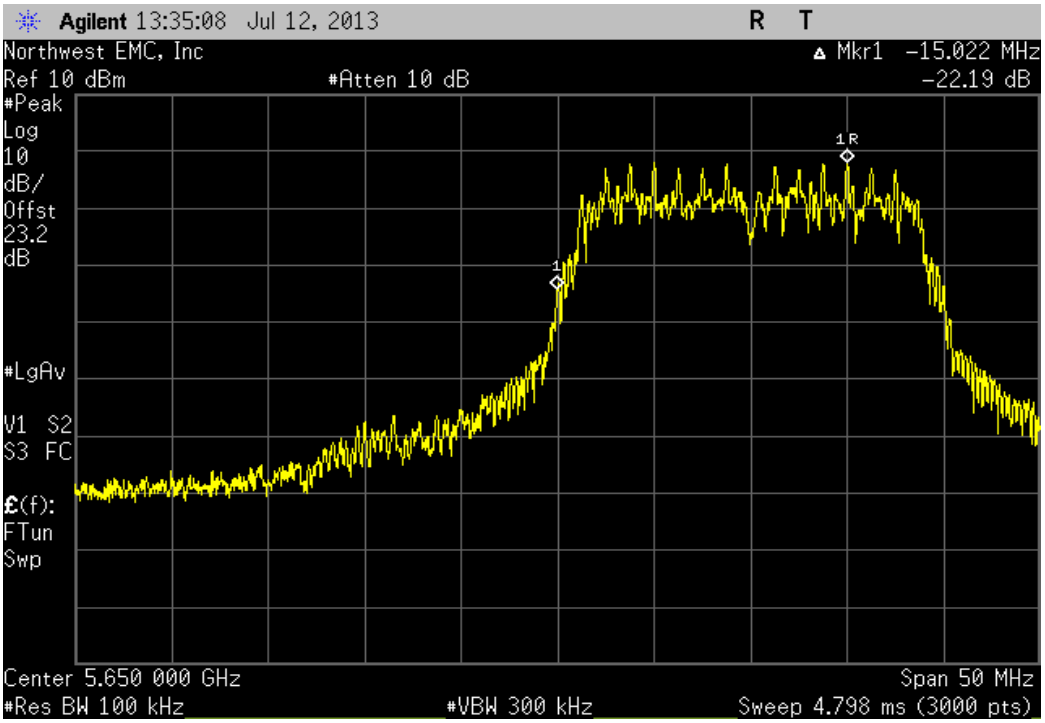
Chain B, 20 MHz, 802.11(n) MCS8, Ch 116, High Channel 5580MHz

				Value	Limit	Result
				-48.39 dBc	≤ -20 dBc	Pass



Chain B, 20 MHz, 802.11(n) MCS8, Ch 132, Low Channel 5660MHz

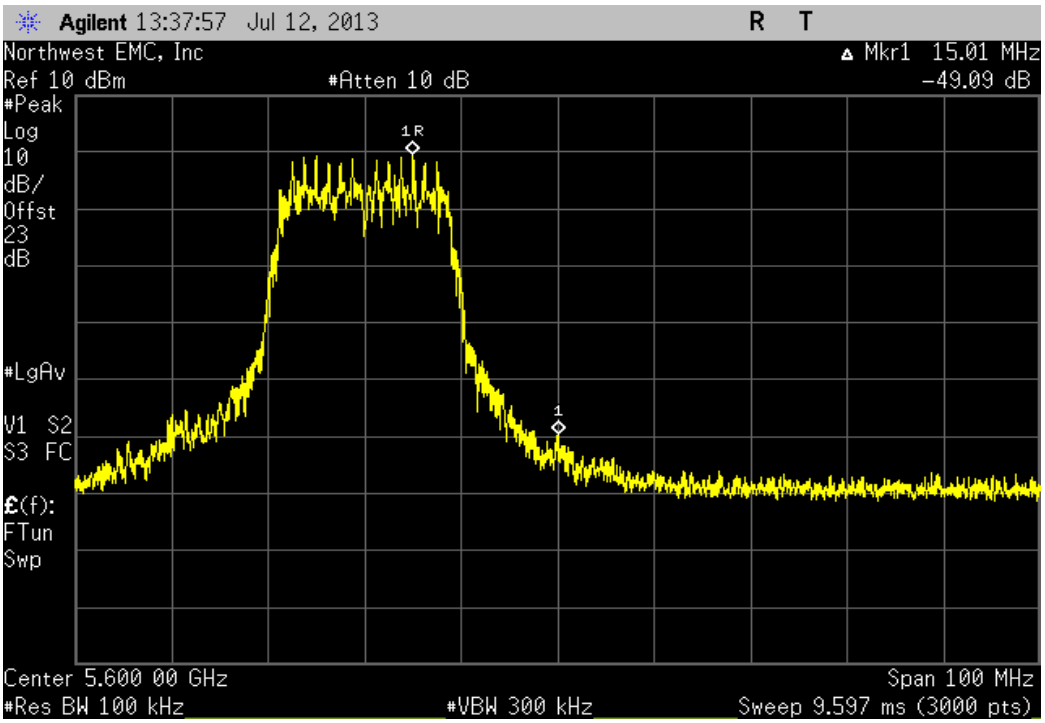
				Value	Limit	Result
				-22.19 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A-B

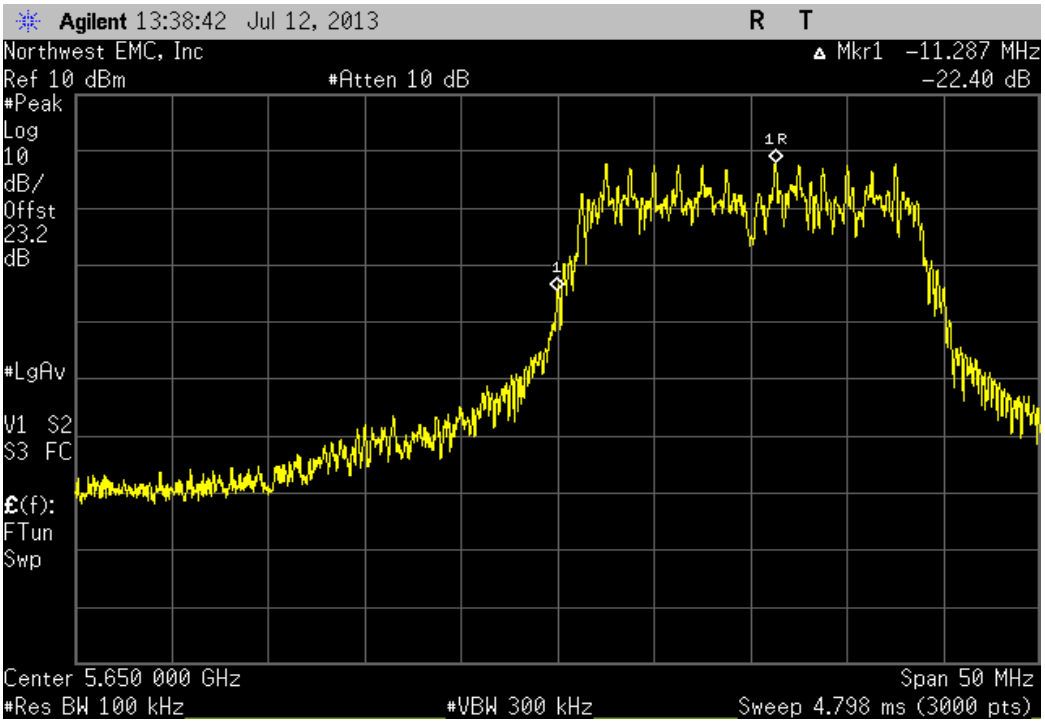
Chain B, 20 MHz, 802.11(n) MCS15, Ch 116, High Channel 5580MHz

				Value	Limit	Result
				-49.1 dBc	≤ -20 dBc	Pass



Chain B, 20 MHz, 802.11(n) MCS15, Ch 132, Low Channel 5660MHz

				Value	Limit	Result
				-22.4 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge. A DC block is placed in-line for all measurements. The EUT power level is set at 12 dBm for all channels.

Band Edge Compliance - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	07/11/13
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	43%
Project:	None	Barometric Pres.:	1018 mb
Tested by:	Brandon Hobbs, Richard Mellroth	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

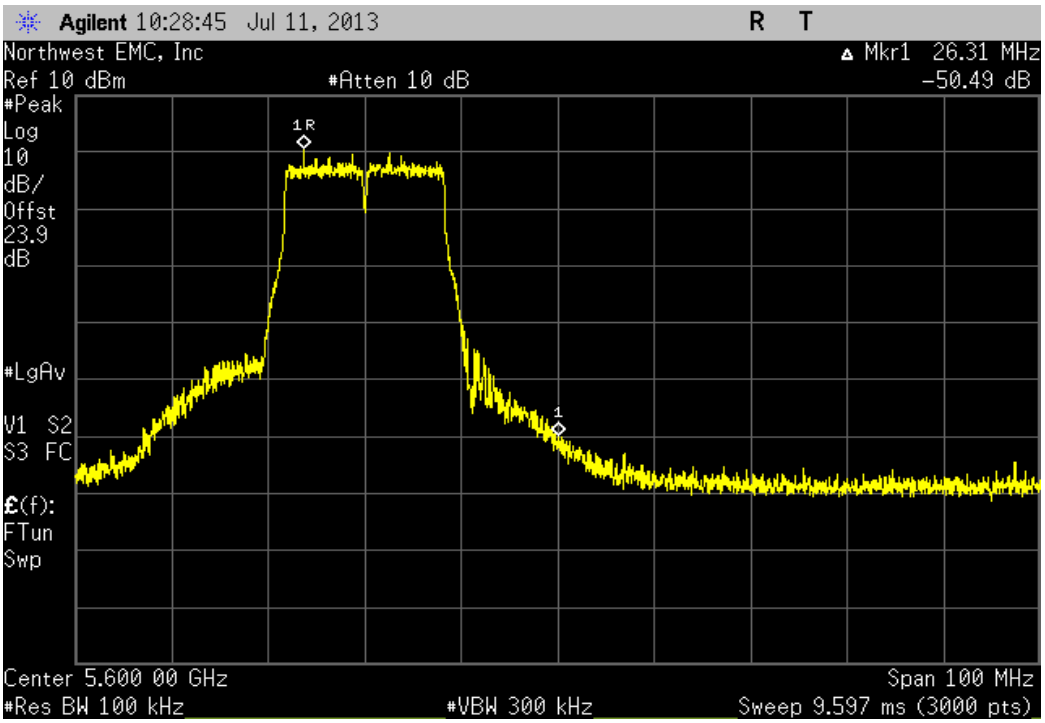
Configuration #	1	Signature

		Value	Limit	Result
802.11(a) 6 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-50.49 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-31.25 dBc	≤ -20 dBc	Pass
802.11(a) 36 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-50.94 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-30.35 dBc	≤ -20 dBc	Pass
802.11(a) 54 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-51.57 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-30.36 dBc	≤ -20 dBc	Pass
802.11(n) MCS0				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-48.99 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-26 dBc	≤ -20 dBc	Pass
802.11(n) MCS7				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-47.81 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-25.91 dBc	≤ -20 dBc	Pass

Band Edge Compliance - Antenna A

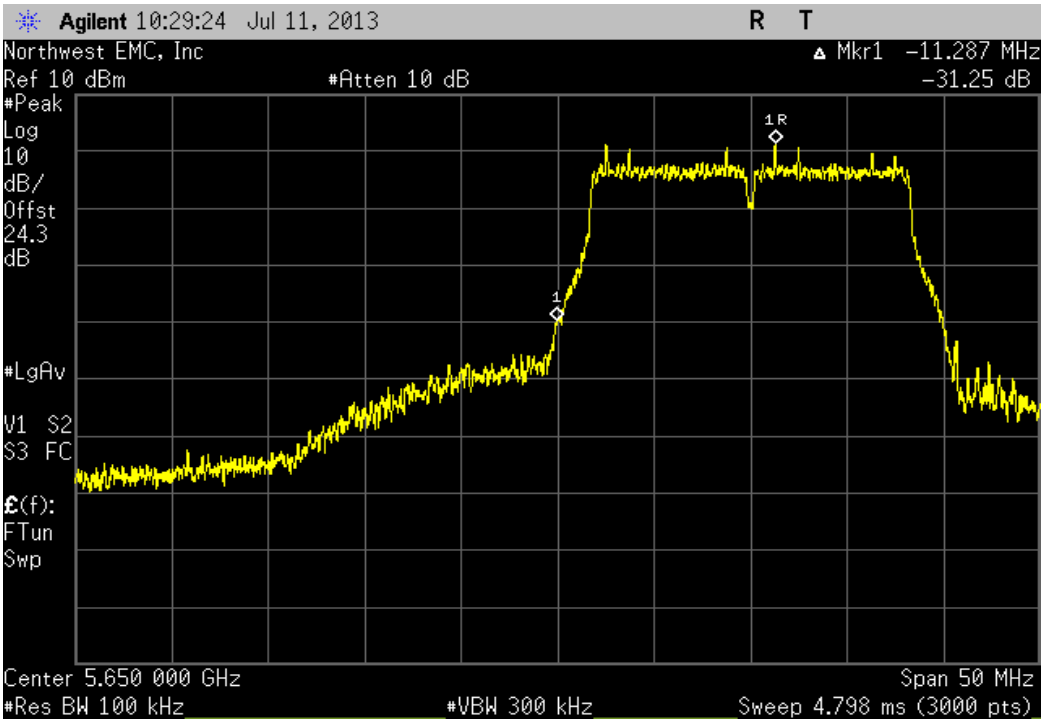
802.11(a) 6 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-50.49 dBc	≤ -20 dBc	Pass



802.11(a) 6 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

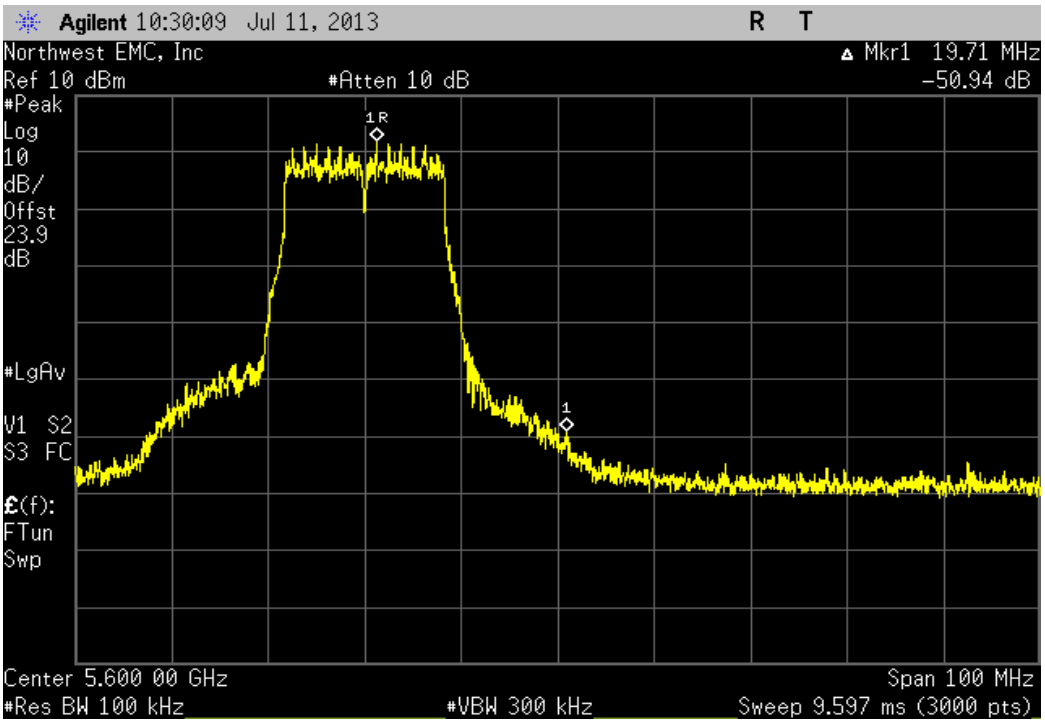
				Value	Limit	Result
				-31.25 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A

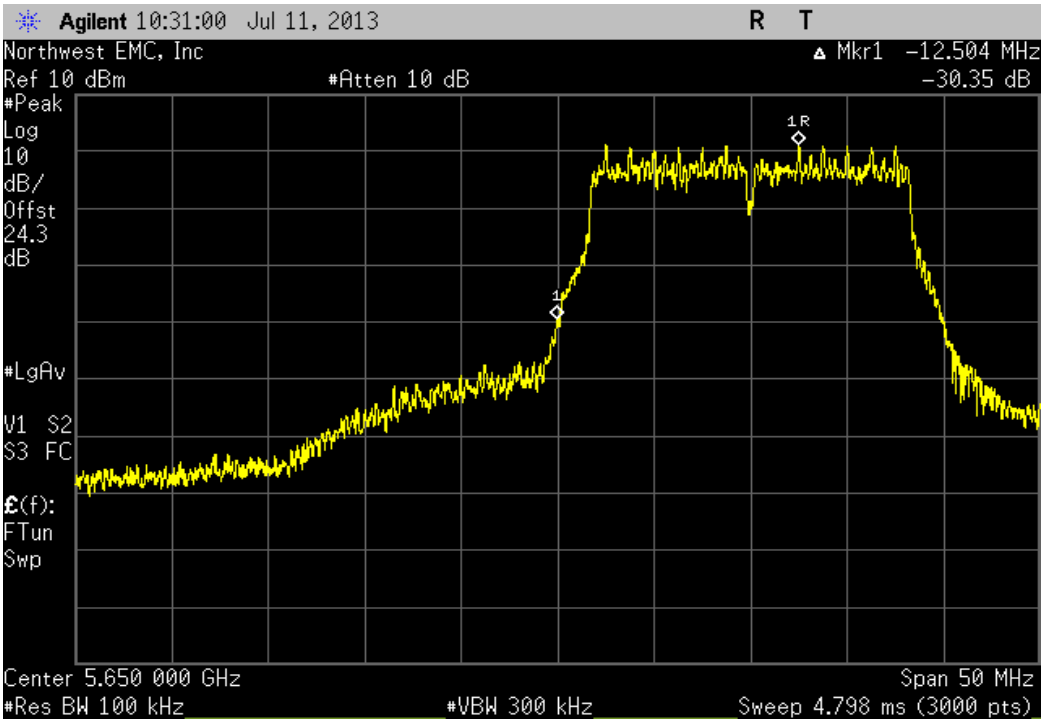
802.11(a) 36 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-50.94 dBc	≤ -20 dBc	Pass



802.11(a) 36 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

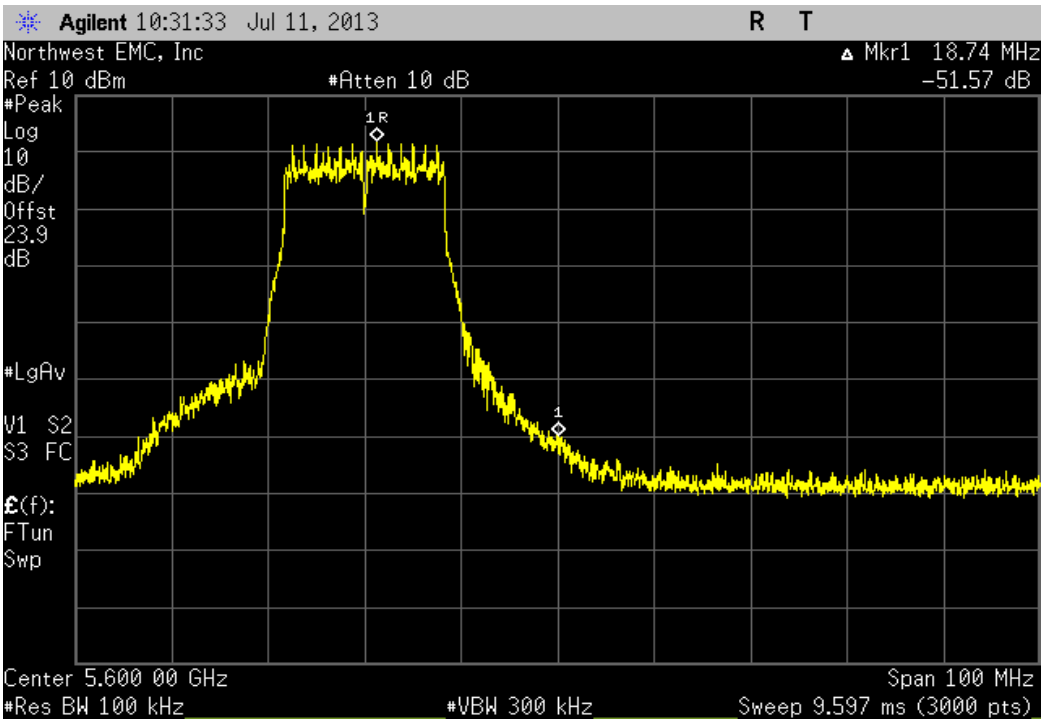
				Value	Limit	Result
				-30.35 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A

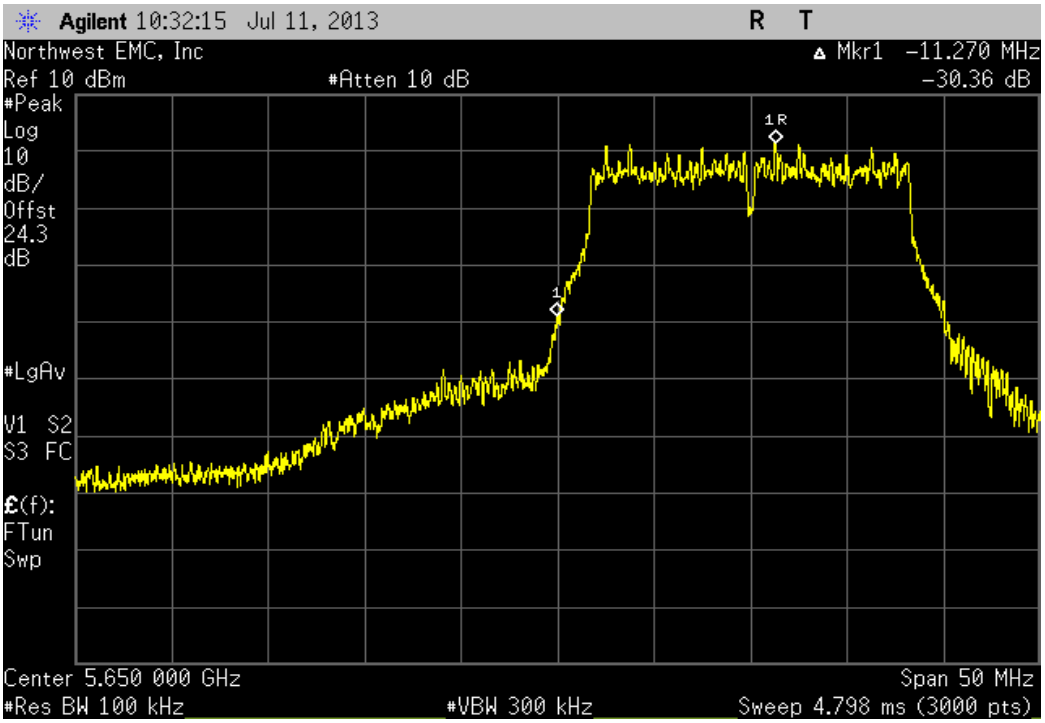
802.11(a) 54 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-51.57 dBc	≤ -20 dBc	Pass



802.11(a) 54 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

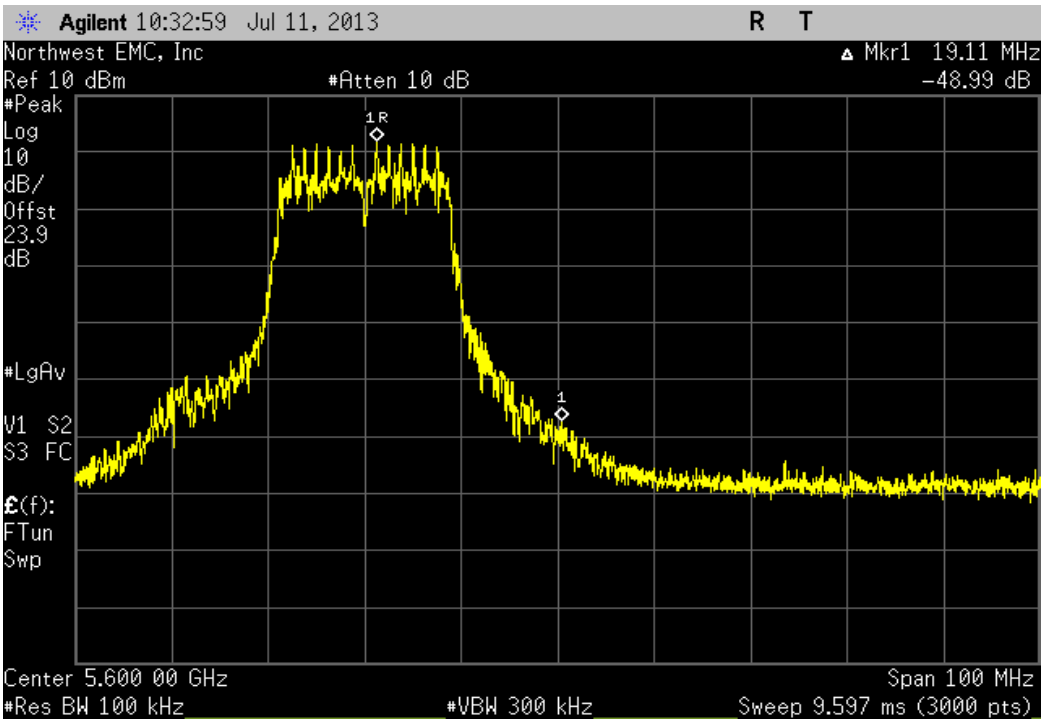
				Value	Limit	Result
				-30.36 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A

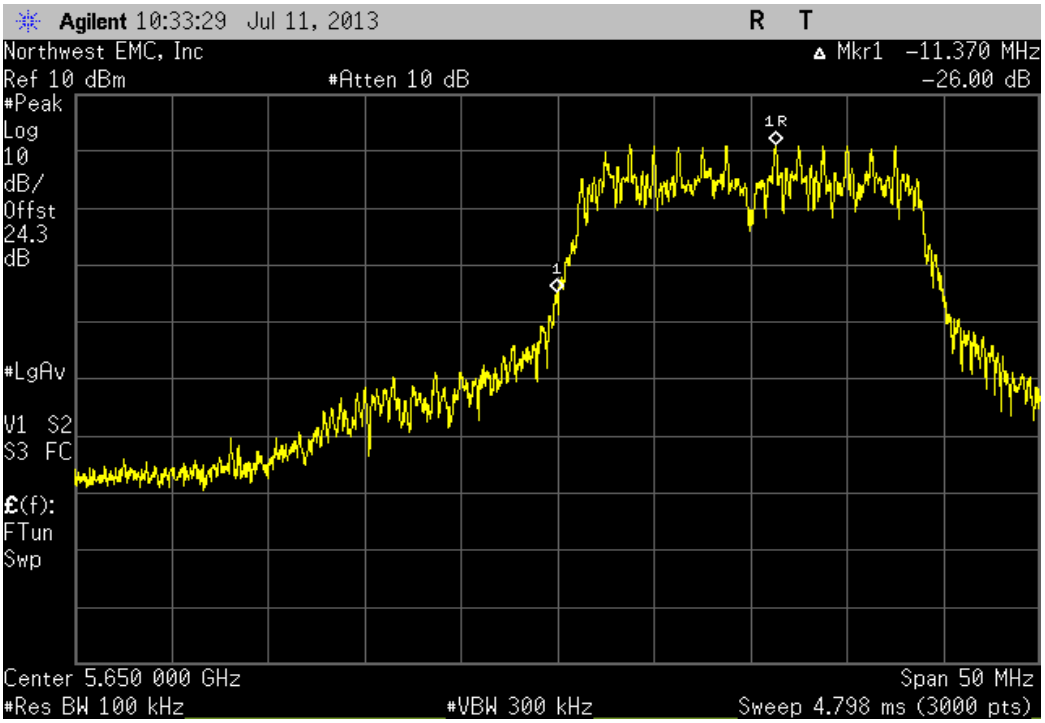
802.11(n) MCS0, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-48.99 dBc	≤ -20 dBc	Pass



802.11(n) MCS0, 5650 MHz Band Edge, Channel 132, 5660 MHz

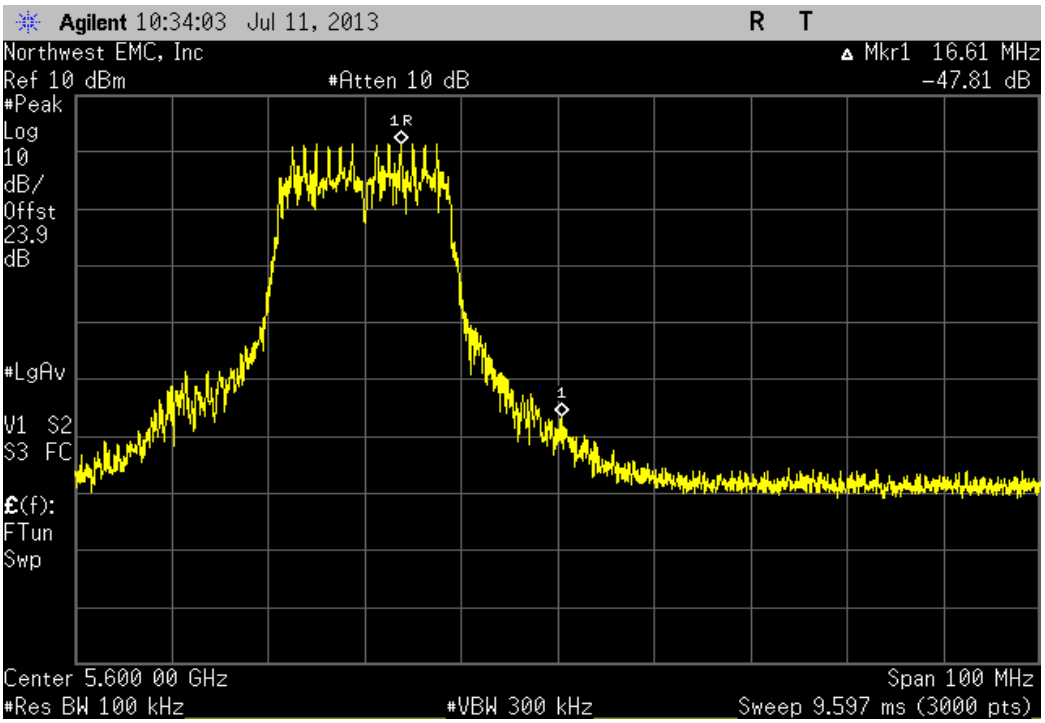
				Value	Limit	Result
				-26 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna A

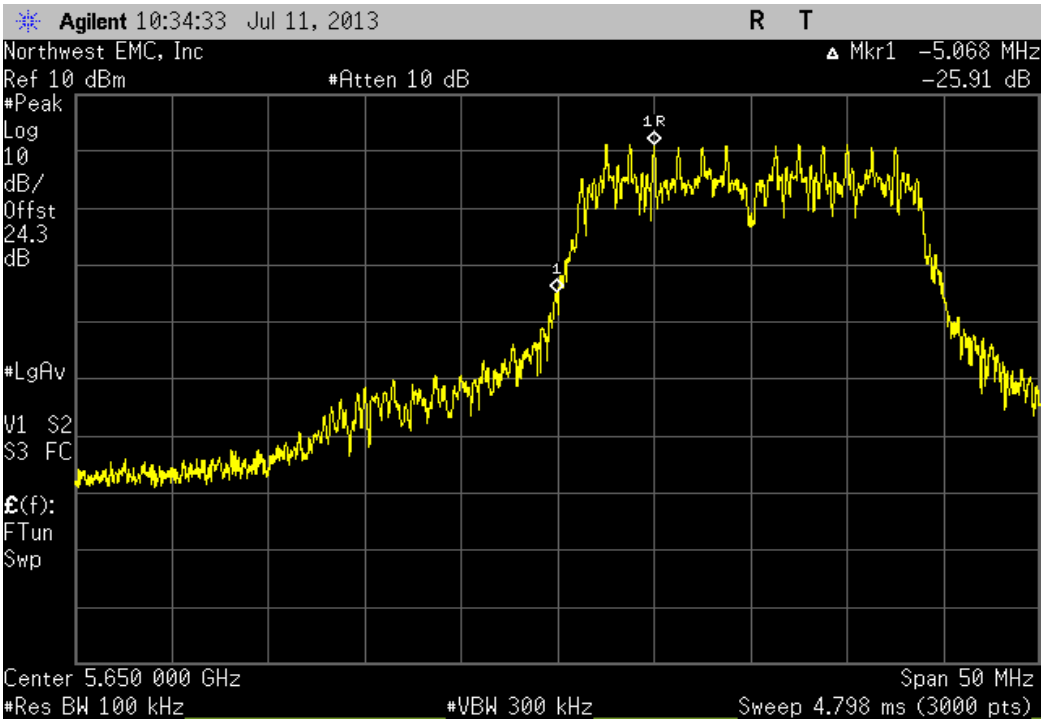
802.11(n) MCS7, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-47.81 dBc	≤ -20 dBc	Pass



802.11(n) MCS7, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-25.91 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna B

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TID	9/19/2011	36
Attenuator	Fairview Microwave	SA4014-20	TKE	2/12/2013	12
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	24
NC02 Cable	ESM Cable Corp.	TTBJ-141 KMKM-72	NC5	7/3/2013	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge. A DC block is placed in-line for all measurements. The EUT power level is set at 12 dBm for all channels.

Band Edge Compliance - Antenna B

EUT:	1601	Work Order:	MCSO1665
Serial Number:	006079632553	Date:	07/11/13
Customer:	Microsoft Corporation	Temperature:	22°C
Attendees:	None	Humidity:	43%
Project:	None	Barometric Pres.:	1018 mb
Tested by:	Brandon Hobbs, Richard Mellroth	Power: 110VAC/60Hz	Job Site: NC02

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

EUT was operating at 100% Duty Cycle. Adapter cable loss of 1.3 dB for 5.7 GHz channels was added to analyzer reference level offset.

DEVIATIONS FROM TEST STANDARD

None

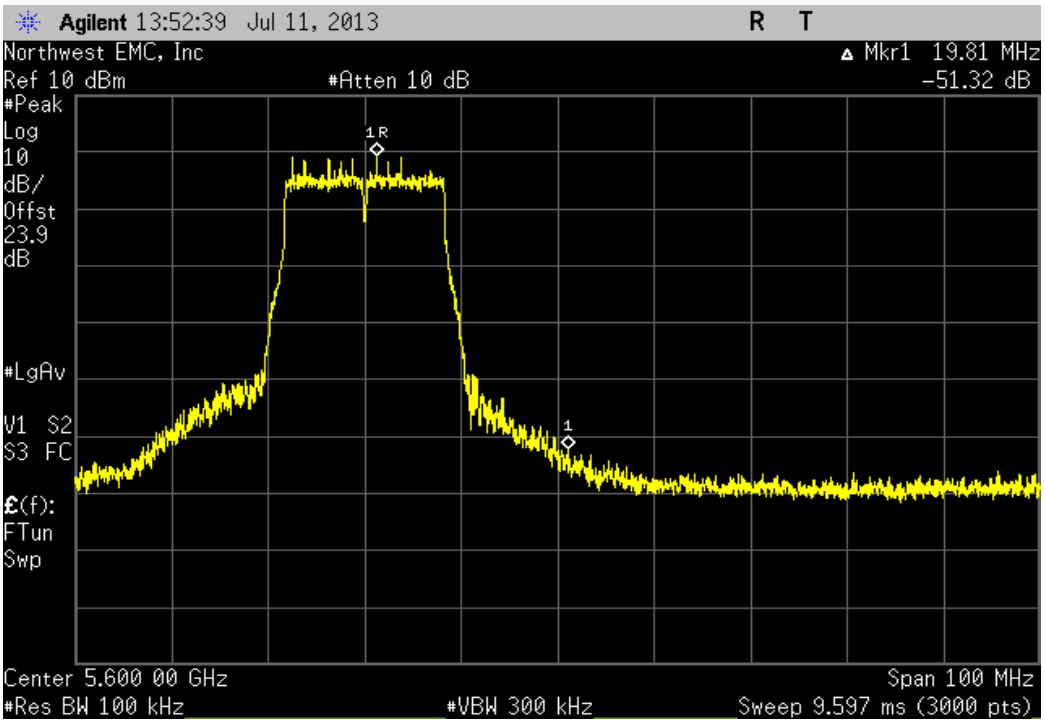
Configuration #	1	Signature

		Value	Limit	Result
802.11(a) 6 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-51.32 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-31.48 dBc	≤ -20 dBc	Pass
802.11(a) 36 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-51.84 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-31.5 dBc	≤ -20 dBc	Pass
802.11(a) 54 Mbps				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-51.22 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-32.47 dBc	≤ -20 dBc	Pass
802.11(n) MCS0				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-46.42 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-21.55 dBc	≤ -20 dBc	Pass
802.11(n) MCS7				
	5600 MHz Band Edge			
	Channel 116, 5580 MHz	-46.09 dBc	≤ -20 dBc	Pass
	5650 MHz Band Edge			
	Channel 132, 5660 MHz	-21.7 dBc	≤ -20 dBc	Pass

Band Edge Compliance - Antenna B

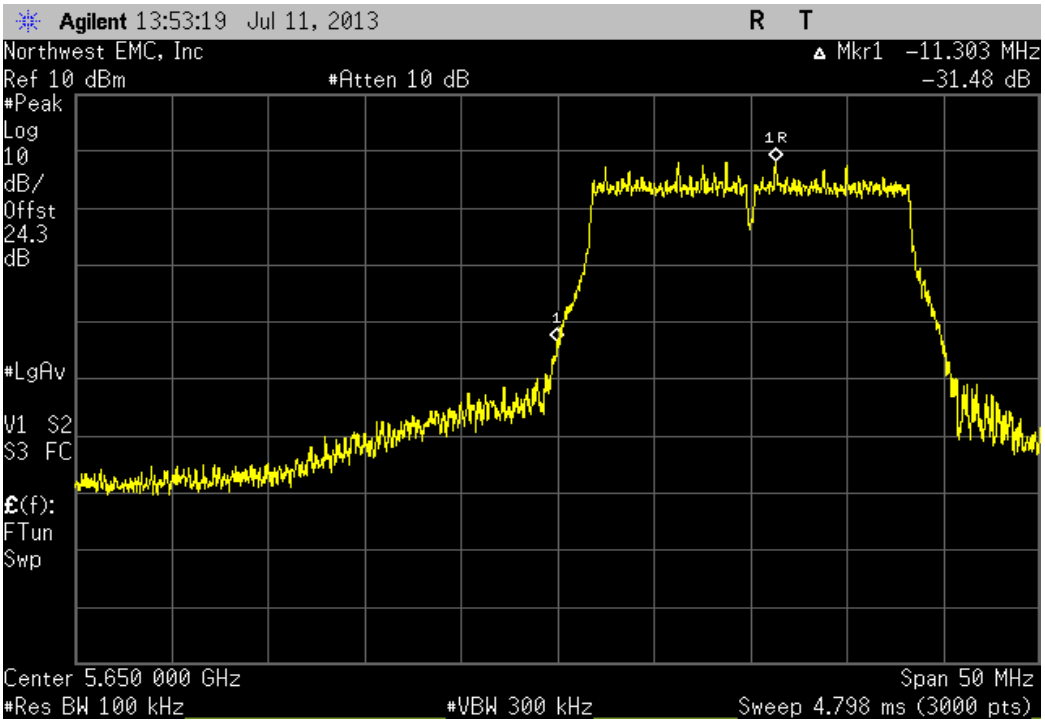
802.11(a) 6 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-51.32 dBc	≤ -20 dBc	Pass



802.11(a) 6 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

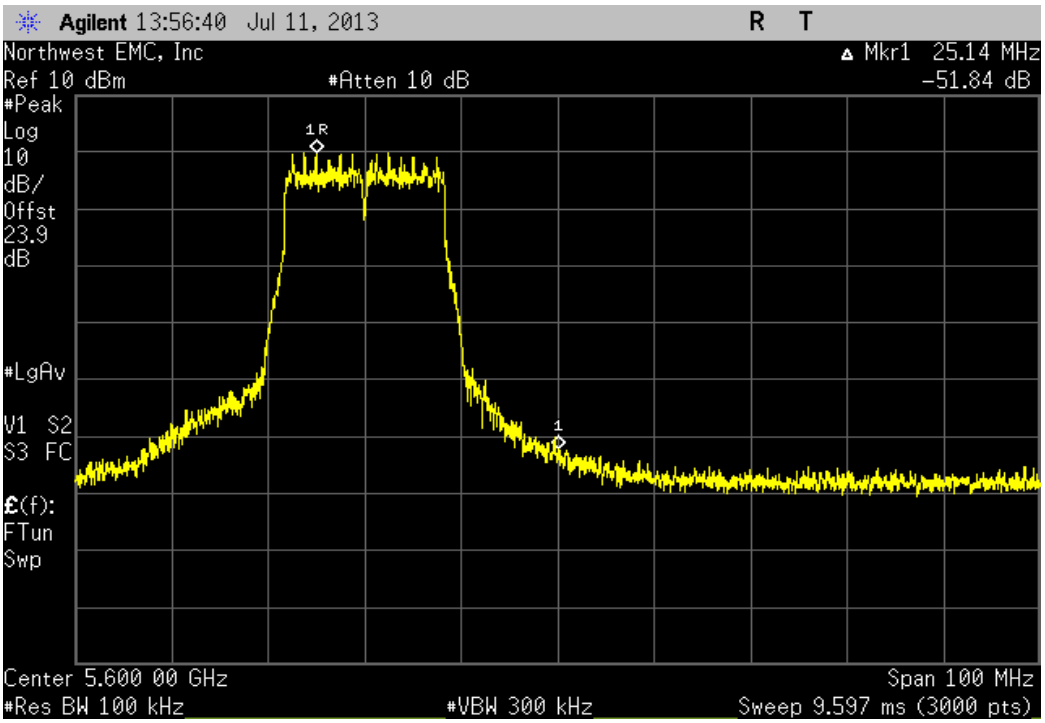
				Value	Limit	Result
				-31.48 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna B

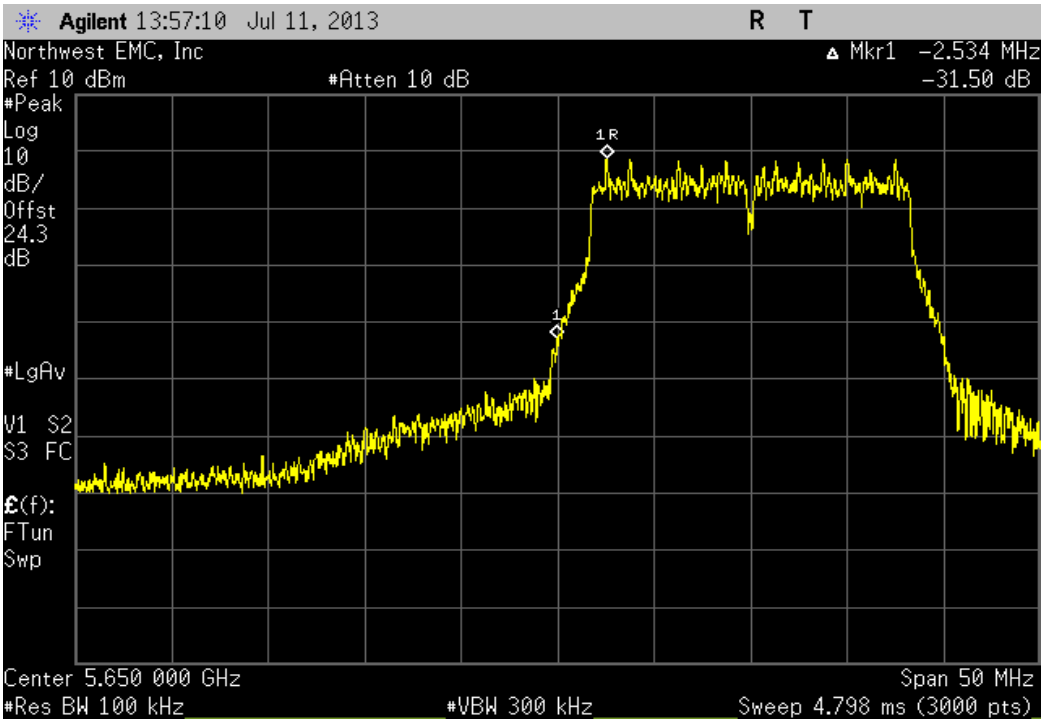
802.11(a) 36 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-51.84 dBc	≤ -20 dBc	Pass



802.11(a) 36 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

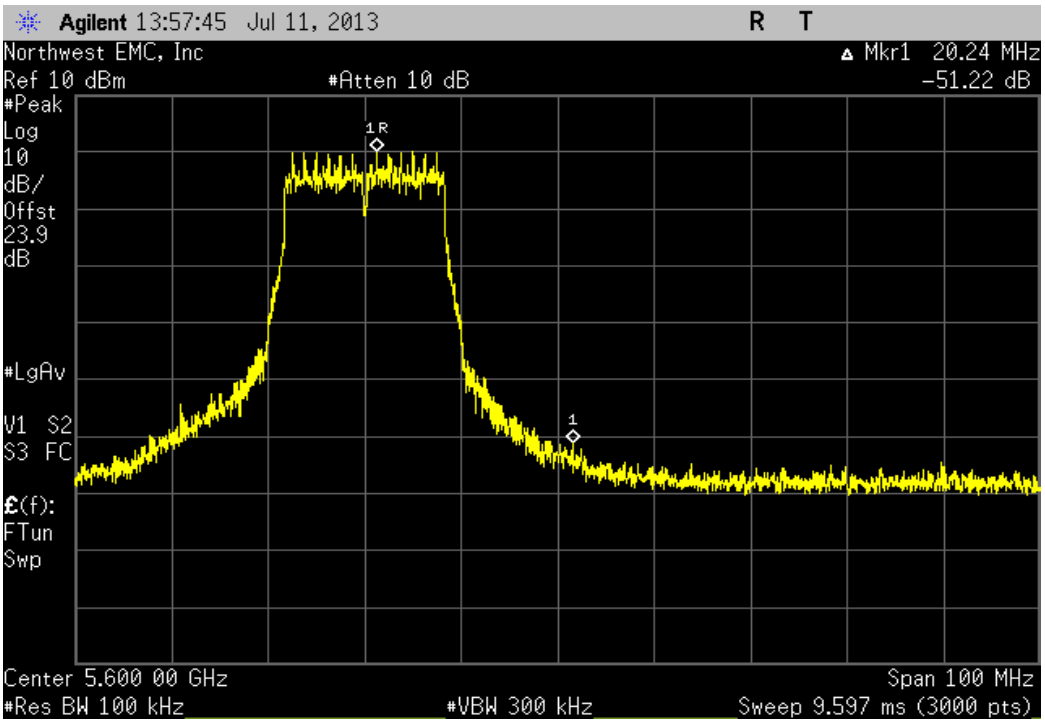
				Value	Limit	Result
				-31.5 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna B

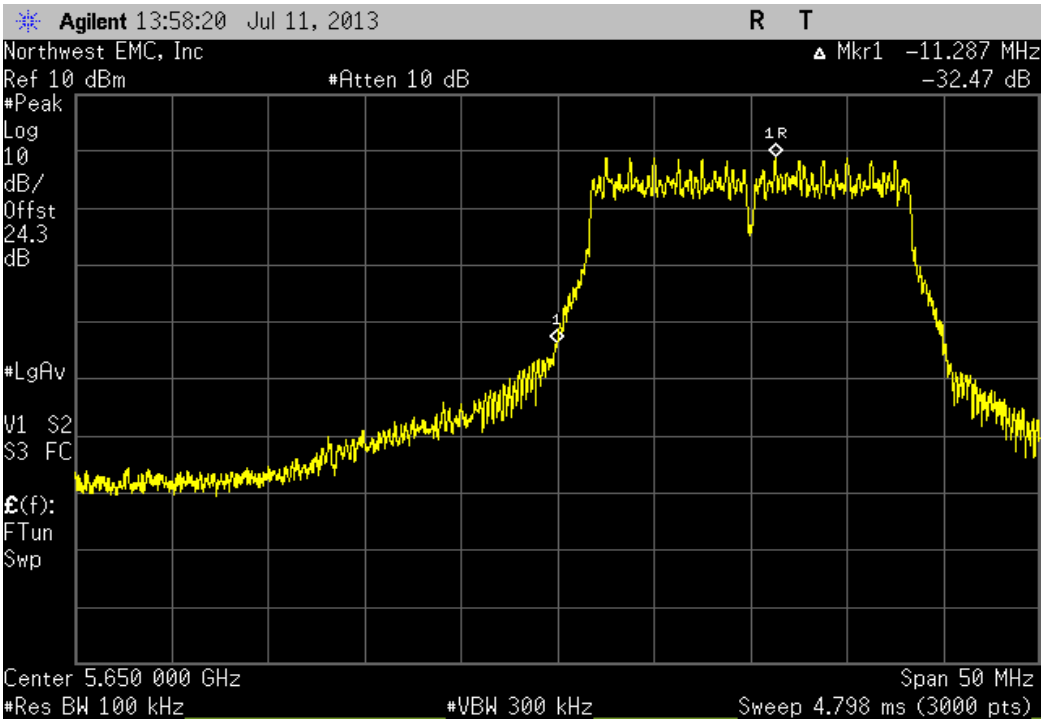
802.11(a) 54 Mbps, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-51.22 dBc	≤ -20 dBc	Pass



802.11(a) 54 Mbps, 5650 MHz Band Edge, Channel 132, 5660 MHz

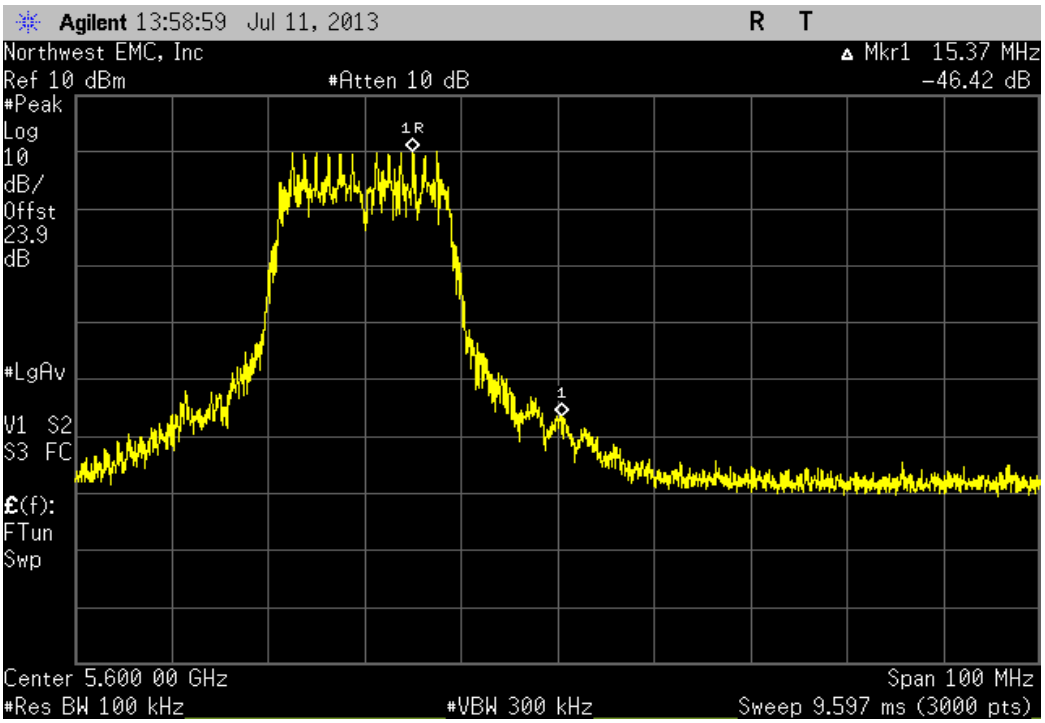
				Value	Limit	Result
				-32.47 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna B

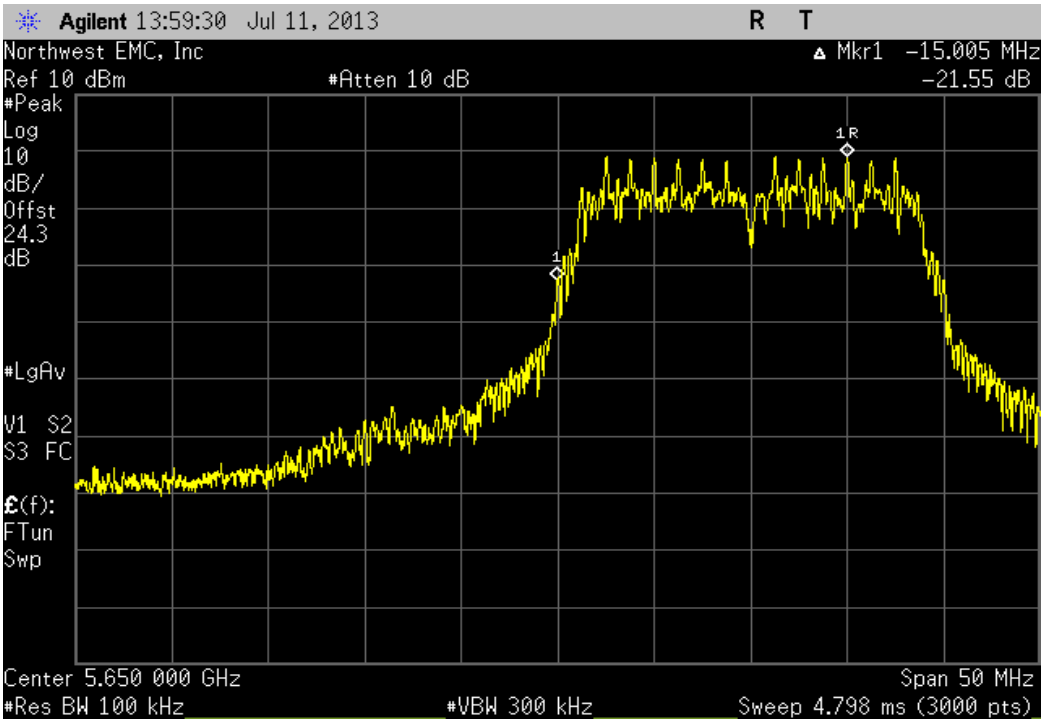
802.11(n) MCS0, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-46.42 dBc	≤ -20 dBc	Pass



802.11(n) MCS0, 5650 MHz Band Edge, Channel 132, 5660 MHz

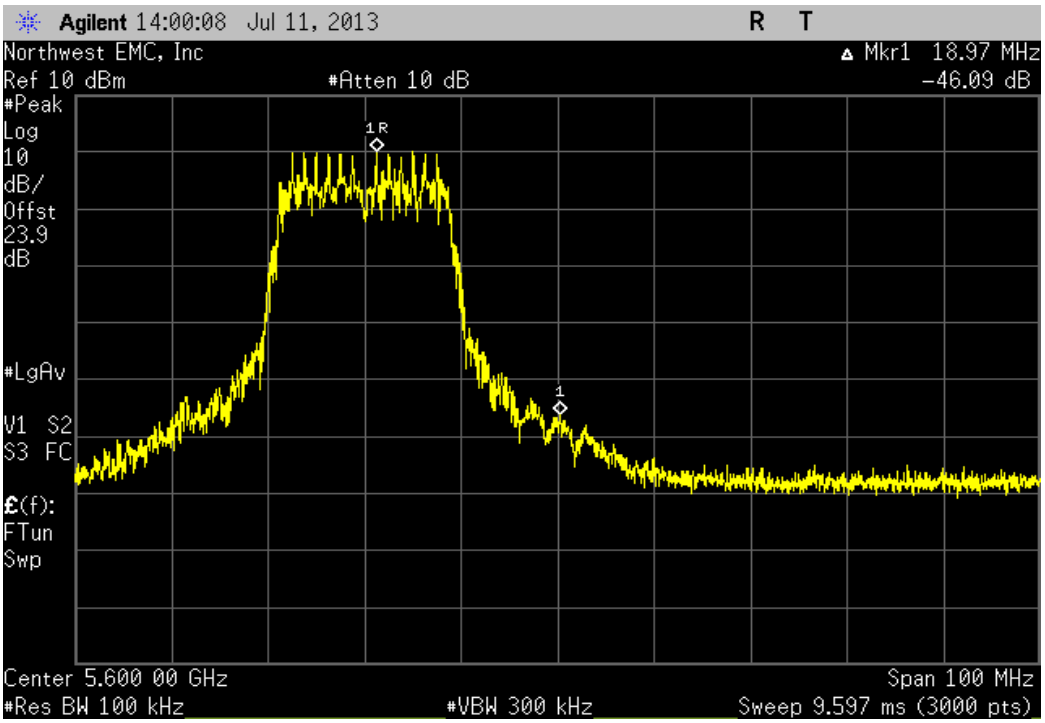
				Value	Limit	Result
				-21.55 dBc	≤ -20 dBc	Pass



Band Edge Compliance - Antenna B

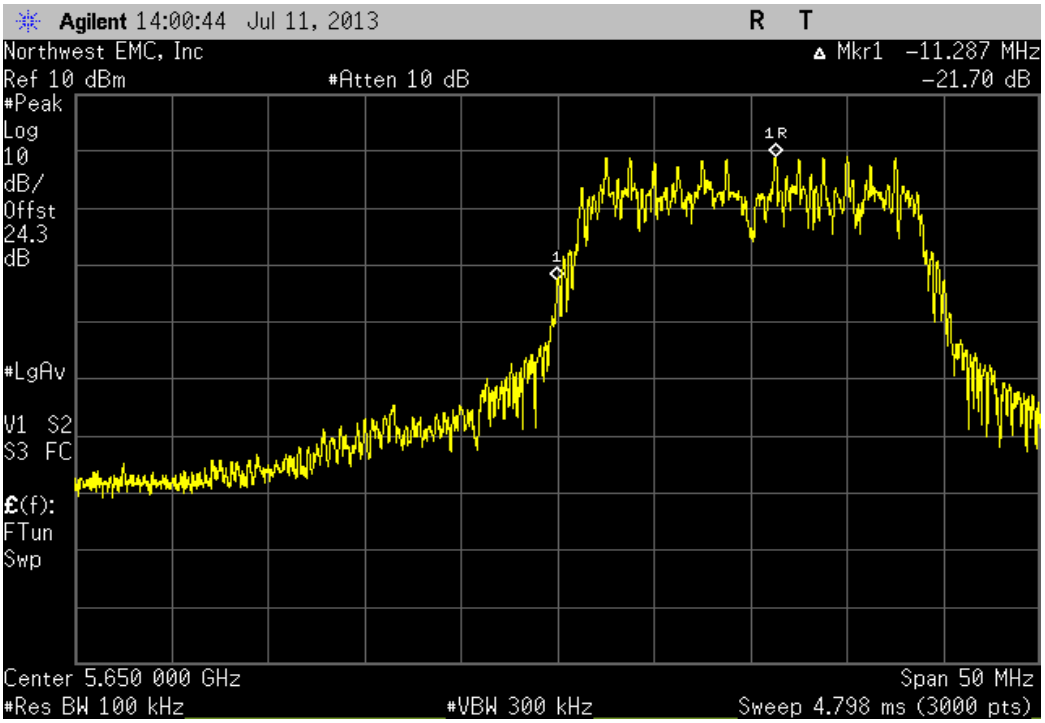
802.11(n) MCS7, 5600 MHz Band Edge, Channel 116, 5580 MHz

				Value	Limit	Result
				-46.09 dBc	≤ -20 dBc	Pass



802.11(n) MCS7, 5650 MHz Band Edge, Channel 132, 5660 MHz

				Value	Limit	Result
				-21.7 dBc	≤ -20 dBc	Pass



SPURIOUS RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION, 5 GHz Band

802.11(a), 6 Mbps
802.11(a), 36 Mbps
802.11(a), 54 Mbps
802.11(n), MCS0
802.11(n), MCS7
802.11(n), MCS8
802.11(n), MCS15

CHANNELS TESTED, 5 GHz BAND, 20 MHz CHANNEL BANDWIDTH

Channel 36, 5180 MHz
Channel 48, 5240 MHz
Channel 52, 5260 MHz
Channel 64, 5320 MHz
Channel 100, 5500 MHz
Channel 116, 5580 MHz
Channel 140, 5700 MHz
Channel 149, 5745 MHz
Channel 157, 5785 MHz
Channel 165, 5825 MHz

CHANNELS TESTED, 5 GHz BAND, 40 MHz CHANNEL BANDWIDTH

Channel 36/40, 5190 MHz
Channel 44/48, 5230 MHz
Channel 52/56, 5270 MHz
Channel 60/64, 5310 MHz
Channel 100/104, 5510 MHz
Channel 132/136, 5670 MHz
Channel 149/153, 5755 MHz
Channel 157/161, 5795 MHz

CONFIGURATIONS INVESTIGATED

MCSO1665 - 2
MCSO1665 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40000 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA18E-20	AQV	1/18/2013	12 mo
HP Filter	Micro-Tronics	HPM50111	HHI	1/18/2013	24 mo
LP Filter	Micro-Tronics	LPM50004	LFF	10/16/2012	24 mo
Attenuator, 'N'	S.M. Electronics	SA3N-20	REG	1/17/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	7/10/2013	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	12/14/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	12/14/2012	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	12/13/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAB	12/13/2012	12 mo
Antenna, Horn	ETS	3160-09	AIY	NCR	0 mo
Antenna, Horn	EMCO	3160-08	AHO	NCR	0 mo
Antenna, Horn	EMCO	3160-07	AHP	NCR	0 mo
Antenna, Horn	EMCO	3115	AHM	6/19/2012	24 mo
Antenna, Biconilog	EMCO	3142	AXJ	5/16/2012	36 mo
Cable I	N/A	Standard Gain Horn Cable	SUM	7/10/2013	12 mo
NC01 Cables	N/A	Standard Gain Horn Cable	NC3	12/14/2012	12 mo

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
NC01 Cables	N/A	3115 Horn Cable	NC2	12/13/2012	12 mo
NC01 Cables	N/A	Bilog Cables	NC1	12/13/2012	12 mo
NC02 Cable	ESM Cable Corp.	TTBJ-141-KMKM-72	NC5	7/3/2013	12 mo
BP Filter	Micro-Tronics	BRC50705	HHM	6/20/2013	36 mo
BP Filter	Micro-Tronics	BRC50704	HHL	6/20/2013	36 mo
BP Filter	Micro-Tronics	BRC50703	HHK	6/20/2013	36 mo
Spectrum Analyzer	Agilent	E4440A	AAW	2/21/2013	24 mo
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	9/11/2012	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	9/11/2012	12 mo
Antenna, Horn	ETS Lindgren	3160-10	AIW	NCR	0 mo
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVR	6/24/2013	12 mo
OC Cable	ESM Cable Corp.	KMKM-72	OCV	6/24/2013	12 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	24 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

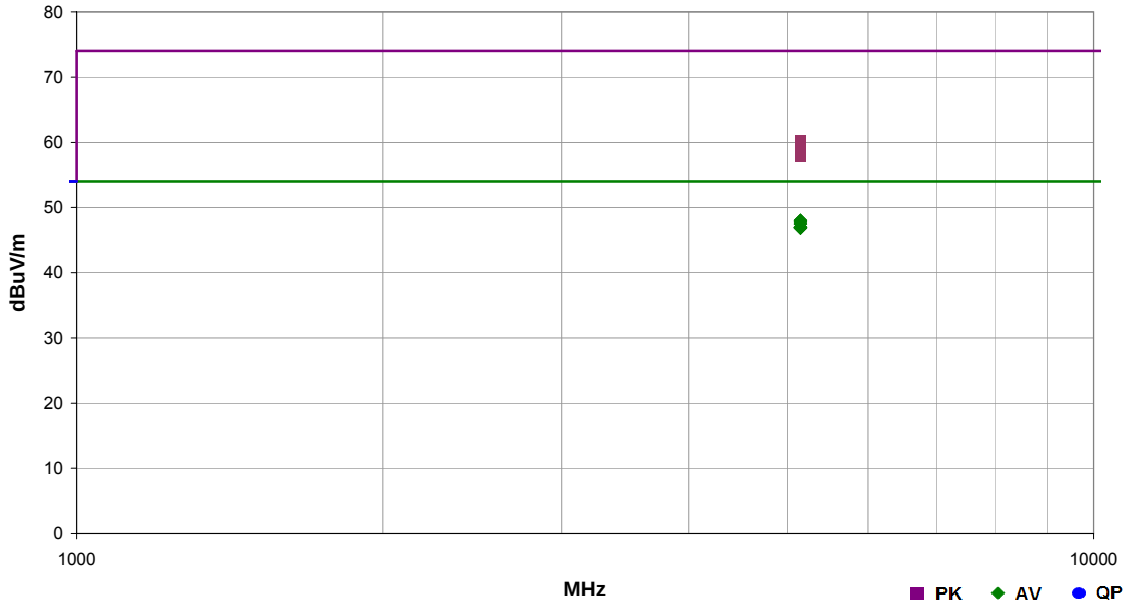
The power level used while under test for the 5 GHz band, 20 MHz and 40 MHz bandwidths was set at 12 dBm unless otherwise noted. All average measurements above 1 GHz were performed using a RMS Average Detector, except for measurements made at the 5150 MHz, 5350 MHz, and 5460 MHz restricted band edges, where an average detector employing a 10 Hz VBW was used as per FCC KDB 913591. The EUT was transmitting at a 100% duty cycle for the duration of the test.

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	23 °C		
Job Site:	NC01	**Humidity:**	47% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 36, 5180 MHz				
Deviations:	None				
Comments:	5150 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	122-123	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5149.563	22.1	35.5	1.0	165.0	1.0	0.0	Vert	AV	-9.5	48.0	54.0	-6.0	Ch 36, EUT Vert, Ant A, 36 Mbps
5149.547	22.1	35.5	1.0	178.0	1.0	0.0	Vert	AV	-9.5	48.0	54.0	-6.0	Ch 36, EUT Vert, Ant A, 6 Mbps
5148.943	22.1	35.5	1.0	164.0	1.0	0.0	Vert	AV	-9.5	48.0	54.0	-6.0	Ch 36, EUT Vert, Ant A, MCS0
5149.707	21.9	35.5	1.0	144.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 36, EUT Vert, Ant A, MCS7
5149.350	21.9	35.5	1.0	160.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 36, EUT Vert, Ant A, 54 Mbps
5149.950	21.7	35.5	1.0	360.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	Ch 36, EUT Horz, Ant A, 6 Mbps
5149.960	21.5	35.5	1.0	164.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 36, EUT Flat, Ant A, 6 Mbps
5149.773	21.5	35.5	1.0	0.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 36, EUT Horz, Ant AB, 6 Mbps
5149.607	21.5	35.5	1.0	15.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 36, EUT Horz, Ant AB, MCS15
5148.033	21.1	35.5	1.0	182.0	1.0	0.0	Vert	AV	-9.5	47.0	54.0	-7.0	Ch 36, EUT Vert, Ant B, 6 Mbps
5149.917	21.0	35.5	1.0	167.0	1.0	0.0	Horz	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Vert, Ant A, 6 Mbps
5149.920	21.0	35.5	1.0	329.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Vert, Ant AB, 6 Mbps
5149.903	21.0	35.5	1.0	31.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Vert, Ant B, MCS7
5149.853	21.0	35.5	1.0	79.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Flat, Ant B, 6 Mbps
5149.347	21.0	35.5	1.0	260.0	1.0	0.0	Horz	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Flat, Ant B, 6 Mbps
5149.087	21.0	35.5	1.0	29.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Horz, Ant A, 6 Mbps
5148.733	21.0	35.5	1.0	0.0	1.0	0.0	Horz	AV	-9.5	46.9	54.0	-7.1	Ch 36 , EUT Horz, Ant B, 6 Mbps
5148.537	21.0	35.5	1.0	217.0	1.0	0.0	Horz	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Vert, Ant B, 6 Mbps
5148.370	21.0	35.5	1.0	217.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Horz, Ant AB, 6 Mbps
5148.243	21.0	35.5	1.0	27.0	1.0	0.0	Vert	AV	-9.5	46.9	54.0	-7.1	Ch 36 , EUT Horz, Ant B, 6 Mbps
5148.240	21.0	35.5	1.0	242.0	1.0	0.0	Horz	AV	-9.5	46.9	54.0	-7.1	Ch 36, EUT Vert, Ant AB, 6 Mbps
5149.077	20.9	35.5	1.0	319.0	1.0	0.0	Vert	AV	-9.5	46.8	54.0	-7.2	Ch 36, EUT Flat, Ant AB, 6 Mbps
5148.503	20.9	35.5	1.0	63.0	1.0	0.0	Vert	AV	-9.5	46.8	54.0	-7.2	Ch 36, EUT Flat, Ant A, 6 Mbps
5148.177	20.9	35.5	1.0	244.0	1.0	0.0	Horz	AV	-9.5	46.8	54.0	-7.2	Ch 36, EUT Flat, Ant AB, 6 Mbps
5149.743	34.4	35.5	1.0	160.0	1.0	0.0	Vert	PK	-9.5	60.3	74.0	-13.7	Ch 36, EUT Vert, Ant A, 54 Mbps
5149.733	33.8	35.5	1.0	164.0	1.0	0.0	Vert	PK	-9.5	59.7	74.0	-14.3	Ch 36, EUT Vert, Ant A, MCS0
5149.600	33.7	35.5	1.0	178.0	1.0	0.0	Vert	PK	-9.5	59.6	74.0	-14.4	Ch 36, EUT Vert, Ant A, 6 Mbps

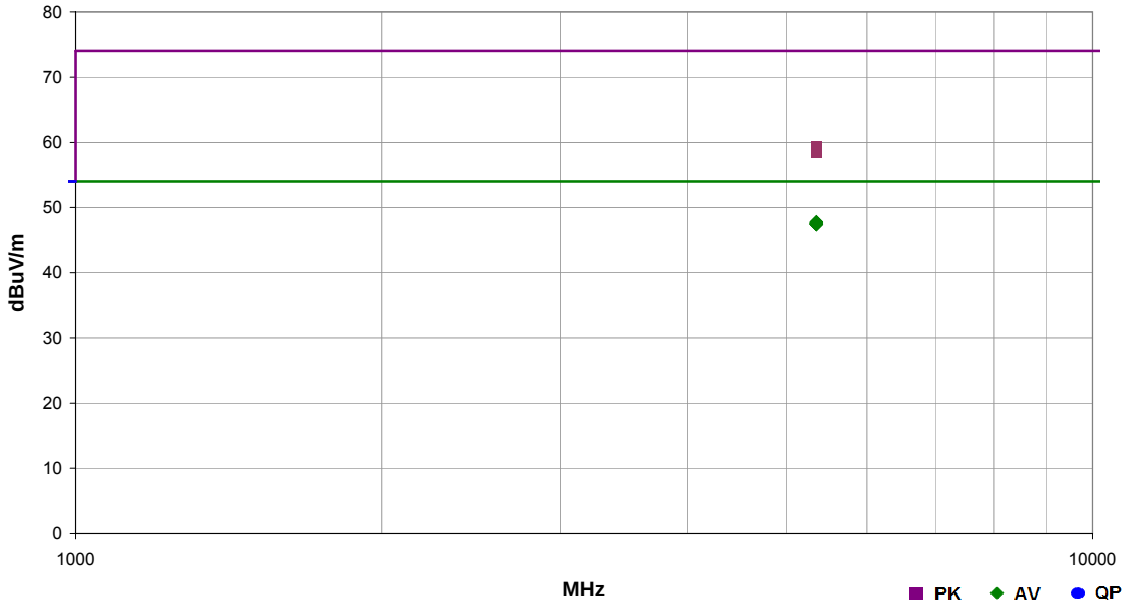
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5148.667	33.7	35.5	1.0	165.0	1.0	0.0	Vert	PK	-9.5	59.6	74.0	-14.4	Ch 36, EUT Vert, Ant A, 36 Mbps
5149.817	33.4	35.5	1.0	144.0	1.0	0.0	Vert	PK	-9.5	59.3	74.0	-14.7	Ch 36, EUT Vert, Ant A, MCS7
5149.483	33.1	35.5	1.0	360.0	1.0	0.0	Horz	PK	-9.5	59.0	74.0	-15.0	Ch 36, EUT Horz, Ant A, 6 Mbps
5149.860	32.8	35.5	1.0	63.0	1.0	0.0	Vert	PK	-9.5	58.7	74.0	-15.3	Ch 36, EUT Flat, Ant A, 6 Mbps
5148.303	32.8	35.5	1.0	15.0	1.0	0.0	Horz	PK	-9.5	58.7	74.0	-15.3	Ch 36, EUT Horz, Ant AB, MCS15
5149.183	32.7	35.5	1.0	164.0	1.0	0.0	Horz	PK	-9.5	58.6	74.0	-15.4	Ch 36, EUT Flat, Ant A, 6 Mbps
5148.023	32.6	35.5	1.0	29.0	1.0	0.0	Vert	PK	-9.5	58.5	74.0	-15.5	Ch 36, EUT Horz, Ant A, 6 Mbps
5149.707	32.5	35.5	1.0	0.0	1.0	0.0	Horz	PK	-9.5	58.4	74.0	-15.6	Ch 36, EUT Horz, Ant AB, 6 Mbps
5148.353	32.5	35.5	1.0	217.0	1.0	0.0	Vert	PK	-9.5	58.4	74.0	-15.6	Ch 36, EUT Horz, Ant AB, 6 Mbps
5148.673	32.3	35.5	1.0	244.0	1.0	0.0	Horz	PK	-9.5	58.2	74.0	-15.8	Ch 36, EUT Flat, Ant AB, 6 Mbps
5148.517	32.3	35.5	1.0	27.0	1.0	0.0	Vert	PK	-9.5	58.2	74.0	-15.8	Ch 36 , EUT Horz, Ant B, 6 Mbps
5149.303	32.2	35.5	1.0	329.0	1.0	0.0	Vert	PK	-9.5	58.1	74.0	-15.9	Ch 36, EUT Vert, Ant AB, 6 Mbps
5148.683	32.2	35.5	1.0	0.0	1.0	0.0	Horz	PK	-9.5	58.1	74.0	-15.9	Ch 36 , EUT Horz, Ant B, 6 Mbps
5148.497	32.2	35.5	1.0	260.0	1.0	0.0	Horz	PK	-9.5	58.1	74.0	-15.9	Ch 36, EUT Flat, Ant B, 6 Mbps
5148.377	32.2	35.5	1.0	79.0	1.0	0.0	Vert	PK	-9.5	58.1	74.0	-15.9	Ch 36, EUT Flat, Ant B, 6 Mbps
5148.220	32.2	35.5	1.0	167.0	1.0	0.0	Horz	PK	-9.5	58.1	74.0	-15.9	Ch 36, EUT Vert, Ant A, 6 Mbps
5149.483	32.1	35.5	1.0	242.0	1.0	0.0	Horz	PK	-9.5	58.0	74.0	-16.0	Ch 36, EUT Vert, Ant AB, 6 Mbps
5148.440	32.1	35.5	1.0	319.0	1.0	0.0	Vert	PK	-9.5	58.0	74.0	-16.0	Ch 36, EUT Flat, Ant AB, 6 Mbps
5149.923	31.9	35.5	1.0	31.0	1.0	0.0	Vert	PK	-9.5	57.8	74.0	-16.2	Ch 36, EUT Vert, Ant B, MCS7
5149.413	31.9	35.5	1.0	182.0	1.0	0.0	Vert	PK	-9.5	57.8	74.0	-16.2	Ch 36, EUT Vert, Ant B, 6 Mbps
5149.413	31.9	35.5	1.0	217.0	1.0	0.0	Horz	PK	-9.5	57.8	74.0	-16.2	Ch 36, EUT Vert, Ant B, 6 Mbps

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	23 °C		
Job Site:	NC01	**Humidity:**	47% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 64, 5320 MHz				
Deviations:	None				
Comments:	5350 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	124-125	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5350.300	21.6	35.8	1.0	125.0	1.0	0.0	Vert	AV	-9.5	47.9	54.0	-6.1	Ch 64, EUT Vert, Ant A, 54 Mbps
5351.897	21.5	35.8	1.0	148.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 64, EUT Vert, Ant A, 6 Mbps
5351.197	21.5	35.8	1.0	138.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 64, EUT Vert, Ant A, MCS7
5350.863	21.5	35.8	1.0	159.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 64, EUT Vert, Ant AB, 6 Mbps
5350.827	21.5	35.8	1.0	48.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	Ch 64, EUT Horz, Ant B, 6 Mbps
5350.290	21.5	35.8	1.0	136.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	Ch 64, EUT Flat, Ant B, 6 Mbps
5350.033	21.4	35.8	1.0	155.0	1.0	0.0	Vert	AV	-9.5	47.7	54.0	-6.3	Ch 64, EUT Vert, Ant A, MCS0
5351.380	21.3	35.8	1.0	89.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	Ch 64, EUT Vert, Ant A, 36 Mbps
5351.030	21.3	35.8	1.0	77.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	Ch 64, EUT Vert, Ant AB, MCS15
5350.523	21.3	35.8	1.0	344.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	Ch 64, EUT Horz, Ant AB, 6 Mbps
5350.250	21.3	35.8	1.0	159.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	Ch 64, EUT Flat, Ant A, 6 Mbps
5351.460	21.2	35.8	1.0	158.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Horz, Ant A, 6 Mbps
5351.410	21.2	35.8	1.0	212.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Flat, Ant B, 6 Mbps
5351.350	21.2	35.8	1.0	42.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Horz, Ant A, 6 Mbps
5351.357	21.2	35.8	1.0	45.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Horz, Ant AB, 6 Mbps
5350.703	21.2	35.8	1.0	117.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Flat, Ant AB, 6 Mbps
5350.623	21.2	35.8	1.0	228.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Flat, Ant A, 6 Mbps
5350.613	21.2	35.8	1.0	111.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Flat, Ant B, MCS7
5350.523	21.2	35.8	1.0	22.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Flat, Ant AB, 6 Mbps
5350.320	21.2	35.8	1.0	48.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Vert, Ant B, 6 Mbps
5350.000	21.2	35.8	1.0	109.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 64, EUT Horz, Ant B, 6 Mbps
5351.257	21.1	35.8	1.0	320.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 64, EUT Vert, Ant A, 6 Mbps
5351.230	21.1	35.8	1.0	255.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 64, EUT Vert, Ant B, 6 Mbps
5350.253	21.1	35.8	1.0	200.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 64, EUT Vert, Ant AB, 6 Mbps
5351.313	33.1	35.8	1.0	148.0	1.0	0.0	Vert	PK	-9.5	59.4	74.0	-14.6	Ch 64, EUT Vert, Ant A, 6 Mbps
5351.050	33.1	35.8	1.0	138.0	1.0	0.0	Vert	PK	-9.5	59.4	74.0	-14.6	Ch 64, EUT Vert, Ant A, MCS7
5350.793	33.1	35.8	1.0	212.0	1.0	0.0	Vert	PK	-9.5	59.4	74.0	-14.6	Ch 64, EUT Flat, Ant B, 6 Mbps

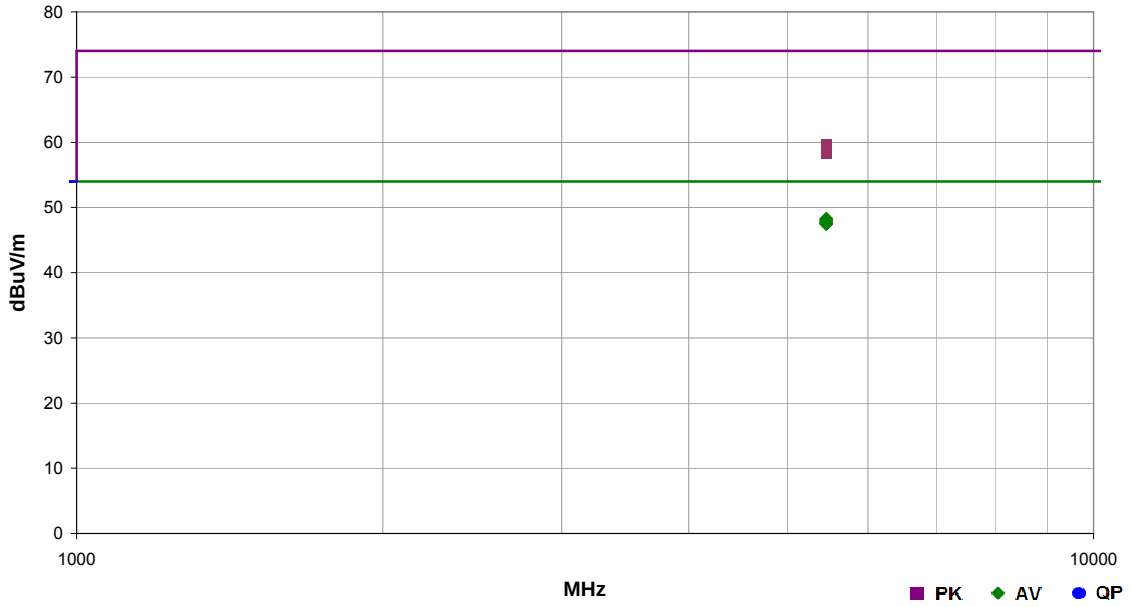
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5351.497	33.0	35.8	1.0	159.0	1.0	0.0	Vert	PK	-9.5	59.3	74.0	-14.7	Ch 64, EUT Vert, Ant AB, 6 Mbps
5350.353	32.9	35.8	1.0	155.0	1.0	0.0	Vert	PK	-9.5	59.2	74.0	-14.8	Ch 64, EUT Vert, Ant A, MCS0
5350.267	32.9	35.8	1.0	159.0	1.0	0.0	Horz	PK	-9.5	59.2	74.0	-14.8	Ch 64, EUT Flat, Ant A, 6 Mbps
5351.357	32.7	35.8	1.0	200.0	1.0	0.0	Horz	PK	-9.5	59.0	74.0	-15.0	Ch 64, EUT Vert, Ant AB, 6 Mbps
5350.963	32.7	35.8	1.0	89.0	1.0	0.0	Vert	PK	-9.5	59.0	74.0	-15.0	Ch 64, EUT Vert, Ant A, 36 Mbps
5350.510	32.7	35.8	1.0	77.0	1.0	0.0	Vert	PK	-9.5	59.0	74.0	-15.0	Ch 64, EUT Vert, Ant AB, MCS15
5350.323	32.7	35.8	1.0	22.0	1.0	0.0	Vert	PK	-9.5	59.0	74.0	-15.0	Ch 64, EUT Flat, Ant AB, 6 Mbps
5350.213	32.7	35.8	1.0	117.0	1.0	0.0	Horz	PK	-9.5	59.0	74.0	-15.0	Ch 64, EUT Flat, Ant AB, 6 Mbps
5351.353	32.6	35.8	1.0	228.0	1.0	0.0	Vert	PK	-9.5	58.9	74.0	-15.1	Ch 64, EUT Flat, Ant A, 6 Mbps
5351.297	32.6	35.8	1.0	344.0	1.0	0.0	Horz	PK	-9.5	58.9	74.0	-15.1	Ch 64, EUT Horz, Ant AB, 6 Mbps
5350.980	32.6	35.8	1.0	158.0	1.0	0.0	Horz	PK	-9.5	58.9	74.0	-15.1	Ch 64, EUT Horz, Ant A, 6 Mbps
5350.790	32.6	35.8	1.0	109.0	1.0	0.0	Vert	PK	-9.5	58.9	74.0	-15.1	Ch 64, EUT Horz, Ant B, 6 Mbps
5350.387	32.6	35.8	1.0	136.0	1.0	0.0	Horz	PK	-9.5	58.9	74.0	-15.1	Ch 64, EUT Flat, Ant B, 6 Mbps
5351.370	32.5	35.8	1.0	42.0	1.0	0.0	Vert	PK	-9.5	58.8	74.0	-15.2	Ch 64, EUT Horz, Ant A, 6 Mbps
5350.980	32.5	35.8	1.0	125.0	1.0	0.0	Vert	PK	-9.5	58.8	74.0	-15.2	Ch 64, EUT Vert, Ant A, 54 Mbps
5350.930	32.5	35.8	1.0	48.0	1.0	0.0	Horz	PK	-9.5	58.8	74.0	-15.2	Ch 64, EUT Horz, Ant B, 6 Mbps
5350.137	32.5	35.8	1.0	111.0	1.0	0.0	Horz	PK	-9.5	58.8	74.0	-15.2	Ch 64, EUT Flat, Ant B, MCS7
5351.320	32.3	35.8	1.0	255.0	1.0	0.0	Horz	PK	-9.5	58.6	74.0	-15.4	Ch 64, EUT Vert, Ant B, 6 Mbps
5350.153	32.3	35.8	1.0	45.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 64, EUT Horz, Ant AB, 6 Mbps
5350.803	32.2	35.8	1.0	320.0	1.0	0.0	Horz	PK	-9.5	58.5	74.0	-15.5	Ch 64, EUT Vert, Ant A, 6 Mbps
5351.057	32.1	35.8	1.0	48.0	1.0	0.0	Vert	PK	-9.5	58.4	74.0	-15.6	Ch 64, EUT Vert, Ant B, 6 Mbps

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	23 °C		
Job Site:	NC01	**Humidity:**	47% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 100, 5500 MHz				
Deviations:	None				
Comments:	5460 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	126-127	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5459.963	21.9	35.9	1.0	161.0	1.0	0.0	Vert	AV	-9.5	48.3	54.0	-5.7	Ch 100, EUT Vert, Ant A, 36 Mbps
5458.943	21.9	35.9	1.0	125.0	1.0	0.0	Vert	AV	-9.5	48.3	54.0	-5.7	Ch 100, EUT Vert, Ant A, MCS0
5459.227	21.8	35.9	1.0	128.0	1.0	0.0	Vert	AV	-9.5	48.2	54.0	-5.8	Ch 100, EUT Vert, Ant A, 54 Mbps
5458.490	21.8	35.9	1.0	132.0	1.0	0.0	Vert	AV	-9.5	48.2	54.0	-5.8	Ch 100, EUT Vert, Ant AB, 6 Mbps
5458.093	21.8	35.9	1.0	148.0	1.0	0.0	Vert	AV	-9.5	48.2	54.0	-5.8	Ch 100, EUT Vert, Ant AB, MCS15
5459.860	21.7	35.9	1.0	120.0	1.0	0.0	Vert	AV	-9.5	48.1	54.0	-5.9	Ch 100, EUT Vert, Ant A, MCS7
5459.693	21.7	35.9	1.0	162.0	1.0	0.0	Horz	AV	-9.5	48.1	54.0	-5.9	Ch 100, EUT Flat, Ant B, 6 Mbps
5459.240	21.7	35.9	1.0	178.0	1.0	0.0	Horz	AV	-9.5	48.1	54.0	-5.9	Ch 100, EUT Flat, Ant AB, 6 Mbps
5458.880	21.7	35.9	1.0	135.0	1.0	0.0	Vert	AV	-9.5	48.1	54.0	-5.9	Ch 100, EUT Vert, Ant A, 6 Mbps
5459.847	21.6	35.9	1.0	0.0	1.0	0.0	Horz	AV	-9.5	48.0	54.0	-6.0	Ch 100, EUT Horz, Ant AB, 6 Mbps
5458.430	21.5	35.9	1.0	133.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	Ch 100, EUT Flat, Ant B, MCS7
5458.167	21.5	35.9	1.0	191.0	1.0	0.0	Horz	AV	-9.5	47.9	54.0	-6.1	Ch 100, EUT Flat, Ant A, 6 Mbps
5458.253	21.4	35.9	1.0	348.0	1.0	0.0	Horz	AV	-9.5	47.8	54.0	-6.2	Ch 100, EUT Horz, Ant A, 6 Mbps
5458.217	21.3	35.9	1.0	124.0	1.0	0.0	Vert	AV	-9.5	47.7	54.0	-6.3	Ch 100, EUT Vert, Ant B, 6 Mbps
5459.830	21.2	35.9	1.0	307.0	1.0	0.0	Horz	AV	-9.5	47.6	54.0	-6.4	Ch 100, EUT Horz, Ant B, 6 Mbps
5459.657	21.1	35.9	1.0	38.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Vert, Ant AB, 6 Mbps
5459.427	21.1	35.9	1.0	201.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Flat, Ant A, 6 Mbps
5458.960	21.1	35.9	1.0	77.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Flat, Ant AB, 6 Mbps
5458.767	21.1	35.9	1.0	300.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Flat, Ant B, 6 Mbps
5458.237	21.1	35.9	1.0	107.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Horz, Ant AB, 6 Mbps
5458.323	21.1	35.9	1.0	157.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Horz, Ant A, 6 Mbps
5458.283	21.1	35.9	1.0	208.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Vert, Ant A, 6 Mbps
5458.093	21.1	35.9	1.0	353.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 100, EUT Vert, Ant B, 6 Mbps
5459.353	21.0	35.9	1.0	328.0	1.0	0.0	Vert	AV	-9.5	47.4	54.0	-6.6	Ch 100, EUT Horz, Ant B, 6 Mbps
5459.817	33.3	35.9	1.0	132.0	1.0	0.0	Vert	PK	-9.5	59.7	74.0	-14.3	Ch 100, EUT Vert, Ant AB, 6 Mbps
5459.420	33.3	35.9	1.0	161.0	1.0	0.0	Vert	PK	-9.5	59.7	74.0	-14.3	Ch 100, EUT Vert, Ant A, 36 Mbps
5458.297	33.3	35.9	1.0	135.0	1.0	0.0	Vert	PK	-9.5	59.7	74.0	-14.3	Ch 100, EUT Vert, Ant A, 6 Mbps

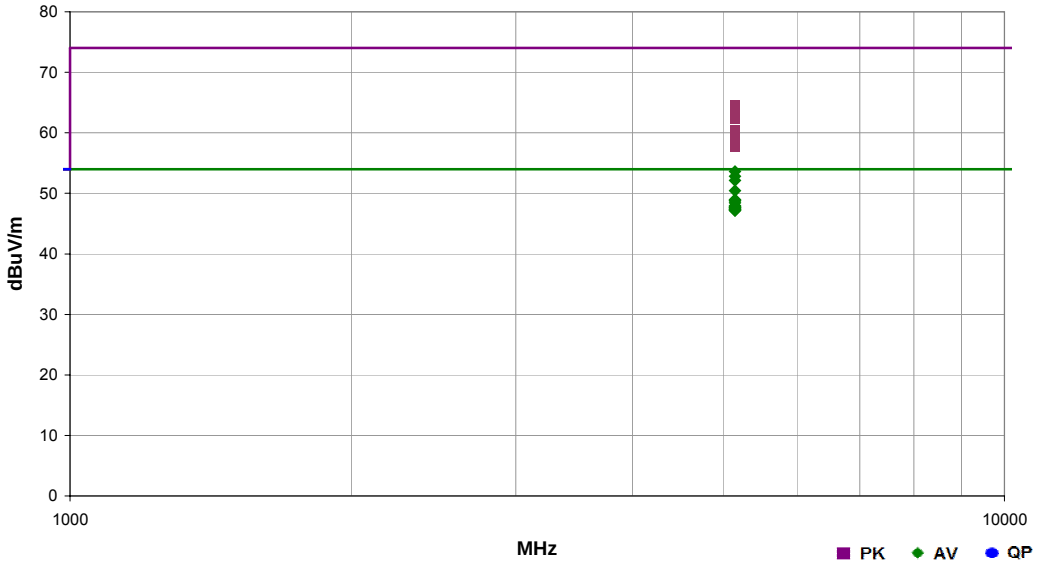
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5459.703	33.2	35.9	1.0	0.0	1.0	0.0	Horz	PK	-9.5	59.6	74.0	-14.4	Ch 100, EUT Horz, Ant AB, 6 Mbps
5458.693	33.1	35.9	1.0	178.0	1.0	0.0	Horz	PK	-9.5	59.5	74.0	-14.5	Ch 100, EUT Flat, Ant AB, 6 Mbps
5458.497	33.1	35.9	1.0	120.0	1.0	0.0	Vert	PK	-9.5	59.5	74.0	-14.5	Ch 100, EUT Vert, Ant A, MCS7
5458.813	33.0	35.9	1.0	77.0	1.0	0.0	Vert	PK	-9.5	59.4	74.0	-14.6	Ch 100, EUT Flat, Ant AB, 6 Mbps
5459.970	32.9	35.9	1.0	125.0	1.0	0.0	Vert	PK	-9.5	59.3	74.0	-14.7	Ch 100, EUT Vert, Ant A, MCS0
5459.357	32.9	35.9	1.0	348.0	1.0	0.0	Horz	PK	-9.5	59.3	74.0	-14.7	Ch 100, EUT Horz, Ant A, 6 Mbps
5459.030	32.9	35.9	1.0	191.0	1.0	0.0	Horz	PK	-9.5	59.3	74.0	-14.7	Ch 100, EUT Flat, Ant A, 6 Mbps
5458.660	32.9	35.9	1.0	148.0	1.0	0.0	Vert	PK	-9.5	59.3	74.0	-14.7	Ch 100, EUT Vert, Ant AB, MCS15
5458.783	32.9	35.9	1.0	124.0	1.0	0.0	Vert	PK	-9.5	59.3	74.0	-14.7	Ch 100, EUT Vert, Ant B, 6 Mbps
5459.750	32.8	35.9	1.0	128.0	1.0	0.0	Vert	PK	-9.5	59.2	74.0	-14.8	Ch 100, EUT Vert, Ant A, 54 Mbps
5459.123	32.7	35.9	1.0	353.0	1.0	0.0	Horz	PK	-9.5	59.1	74.0	-14.9	Ch 100, EUT Vert, Ant B, 6 Mbps
5458.840	32.5	35.9	1.0	162.0	1.0	0.0	Horz	PK	-9.5	58.9	74.0	-15.1	Ch 100, EUT Flat, Ant B, 6 Mbps
5458.690	32.5	35.9	1.0	133.0	1.0	0.0	Horz	PK	-9.5	58.9	74.0	-15.1	Ch 100, EUT Flat, Ant B, MCS7
5458.097	32.5	35.9	1.0	300.0	1.0	0.0	Vert	PK	-9.5	58.9	74.0	-15.1	Ch 100, EUT Flat, Ant B, 6 Mbps
5458.480	32.4	35.9	1.0	157.0	1.0	0.0	Vert	PK	-9.5	58.8	74.0	-15.2	Ch 100, EUT Horz, Ant A, 6 Mbps
5458.050	32.4	35.9	1.0	107.0	1.0	0.0	Vert	PK	-9.5	58.8	74.0	-15.2	Ch 100, EUT Horz, Ant AB, 6 Mbps
5458.330	32.3	35.9	1.0	328.0	1.0	0.0	Vert	PK	-9.5	58.7	74.0	-15.3	Ch 100, EUT Horz, Ant B, 6 Mbps
5458.247	32.3	35.9	1.0	307.0	1.0	0.0	Horz	PK	-9.5	58.7	74.0	-15.3	Ch 100, EUT Horz, Ant B, 6 Mbps
5459.557	32.2	35.9	1.0	201.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 100, EUT Flat, Ant A, 6 Mbps
5458.480	32.2	35.9	1.0	38.0	1.0	0.0	Horz	PK	-9.5	58.6	74.0	-15.4	Ch 100, EUT Vert, Ant AB, 6 Mbps
5458.067	31.9	35.9	1.0	208.0	1.0	0.0	Horz	PK	-9.5	58.3	74.0	-15.7	Ch 100, EUT Vert, Ant A, 6 Mbps

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	23 °C		
Job Site:	NC01	**Humidity:**	47% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 36/40, 5190 MHz				
Deviations:	None				
Comments:	5150 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	141	Test Distance (m)	1	Antenna Height(s)	1-4m	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5148.040	27.7	35.5	1.0	152.0	1.0	0.0	Vert	AV	-9.5	53.6	54.0	-0.4	Ch 36/40, EUT Vert, Ant A, MCS0, 8 dBm
5148.067	26.9	35.5	1.0	178.0	1.0	0.0	Horz	AV	-9.5	52.8	54.0	-1.2	Ch 36/40, EUT Flat, Ant A, MCS0, 8 dBm
5148.077	26.2	35.5	1.0	198.0	1.0	0.0	Horz	AV	-9.5	52.1	54.0	-1.9	Ch 36/40, EUT Flat, Ant AB, MCS0, 8 dBm
5148.043	24.5	35.5	1.0	340.0	1.0	0.0	Horz	AV	-9.5	50.4	54.0	-3.6	Ch 36/40, EUT Horz, Ant AB, MCS0, 8 dBm
5148.047	23.0	35.5	1.0	41.0	1.0	0.0	Horz	AV	-9.5	48.9	54.0	-5.1	Ch 36/40, EUT Horz, Ant B, MCS0, 8 dBm
5148.113	22.9	35.5	1.0	143.0	1.0	0.0	Horz	AV	-9.5	48.8	54.0	-5.2	Ch 36/40, EUT Flat, Ant B, MCS0, 8 dBm
5148.093	22.8	35.5	1.0	54.0	1.0	0.0	Horz	AV	-9.5	48.7	54.0	-5.3	Ch 36/40, EUT Horz, Ant A, MCS0, 8 dBm
5149.957	22.5	35.5	1.0	49.0	1.0	0.0	Horz	AV	-9.5	48.4	54.0	-5.6	Ch 36/40, EUT Horz, Ant B, MCS7, 8 dBm
5148.180	22.0	35.5	1.0	255.0	1.0	0.0	Vert	AV	-9.5	47.9	54.0	-6.1	Ch 36/40, EUT Flat, Ant AB, MCS0, 8 dBm
5148.217	21.9	35.5	1.0	85.0	1.0	0.0	Vert	AV	-9.5	47.8	54.0	-6.2	Ch 36/40, EUT Horz, Ant AB, MCS0, 8 dBm
5148.117	21.8	35.5	1.0	103.0	1.0	0.0	Vert	AV	-9.5	47.7	54.0	-6.3	Ch 36/40, EUT Horz, Ant B, MCS0, 8 dBm
5148.370	21.7	35.5	1.0	178.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	Ch 36/40, EUT Vert, Ant B, MCS0, 8 dBm
5148.090	21.7	35.5	1.0	111.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	Ch 36/40, EUT Horz, Ant A, MCS0, 8 dBm
5148.833	21.5	35.5	1.0	114.0	1.0	0.0	Vert	AV	-9.5	47.4	54.0	-6.6	Ch 36/40, EUT Horz, Ant A, MCS7, 8 dBm
5148.200	21.5	35.5	1.0	15.0	1.0	0.0	Vert	AV	-9.5	47.4	54.0	-6.6	Ch 36/40, EUT Flat, Ant B, MCS0, 8 dBm
5148.153	21.4	35.5	1.0	126.0	1.0	0.0	Horz	AV	-9.5	47.3	54.0	-6.7	Ch 36/40, EUT Vert, Ant A, MCS0, 8 dBm
5148.083	21.4	35.5	1.0	13.0	1.0	0.0	Horz	AV	-9.5	47.3	54.0	-6.7	Ch 36/40, EUT Vert, Ant B, MCS0, 8 dBm
5148.890	21.2	35.5	1.0	73.0	1.0	0.0	Horz	AV	-9.5	47.1	54.0	-6.9	Ch 36/40, EUT Vert, Ant AB, MCS0, 8 dBm
5148.190	21.2	35.5	1.0	248.0	1.0	0.0	Vert	AV	-9.5	47.1	54.0	-6.9	Ch 36/40, EUT Flat, Ant A, MCS0, 8 dBm
5148.147	38.6	35.5	1.0	152.0	1.0	0.0	Vert	PK	-9.5	64.5	74.0	-9.5	Ch 36/40, EUT Vert, Ant A, MCS0, 8 dBm
5148.100	38.1	35.5	1.0	178.0	1.0	0.0	Horz	PK	-9.5	64.0	74.0	-10.0	Ch 36/40, EUT Flat, Ant A, MCS0, 8 dBm
5148.350	36.7	35.5	1.0	198.0	1.0	0.0	Horz	PK	-9.5	62.6	74.0	-11.4	Ch 36/40, EUT Flat, Ant AB, MCS0, 8 dBm
5148.403	36.4	35.5	1.0	340.0	1.0	0.0	Horz	PK	-9.5	62.3	74.0	-11.7	Ch 36/40, EUT Horz, Ant AB, MCS0, 8 dBm
5148.373	34.5	35.5	1.0	41.0	1.0	0.0	Horz	PK	-9.5	60.4	74.0	-13.6	Ch 36/40, EUT Horz, Ant B, MCS0, 8 dBm
5148.190	34.5	35.5	1.0	54.0	1.0	0.0	Horz	PK	-9.5	60.4	74.0	-13.6	Ch 36/40, EUT Horz, Ant A, MCS0, 8 dBm
5148.427	34.3	35.5	1.0	143.0	1.0	0.0	Horz	PK	-9.5	60.2	74.0	-13.8	Ch 36/40, EUT Flat, Ant B, MCS0, 8 dBm
5149.530	34.1	35.5	1.0	49.0	1.0	0.0	Horz	PK	-9.5	60.0	74.0	-14.0	Ch 36/40, EUT Horz, Ant B, MCS7, 8 dBm
5148.287	33.8	35.5	1.0	103.0	1.0	0.0	Vert	PK	-9.5	59.7	74.0	-14.3	Ch 36/40, EUT Horz, Ant B, MCS0, 8 dBm
5148.410	33.1	35.5	1.0	255.0	1.0	0.0	Vert	PK	-9.5	59.0	74.0	-15.0	Ch 36/40, EUT Flat, Ant AB, MCS0, 8 dBm
5148.347	33.1	35.5	1.0	85.0	1.0	0.0	Vert	PK	-9.5	59.0	74.0	-15.0	Ch 36/40, EUT Horz, Ant AB, MCS0, 8 dBm
5149.313	32.7	35.5	1.0	114.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 36/40, EUT Horz, Ant A, MCS7, 8 dBm
5149.047	32.7	35.5	1.0	111.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 36/40, EUT Horz, Ant A, MCS0, 8 dBm
5148.610	32.7	35.5	1.0	248.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 36/40, EUT Flat, Ant A, MCS0, 8 dBm
5148.323	32.7	35.5	1.0	178.0	1.0	0.0	Vert	PK	-9.5	58.6	74.0	-15.4	Ch 36/40, EUT Vert, Ant B, MCS0, 8 dBm

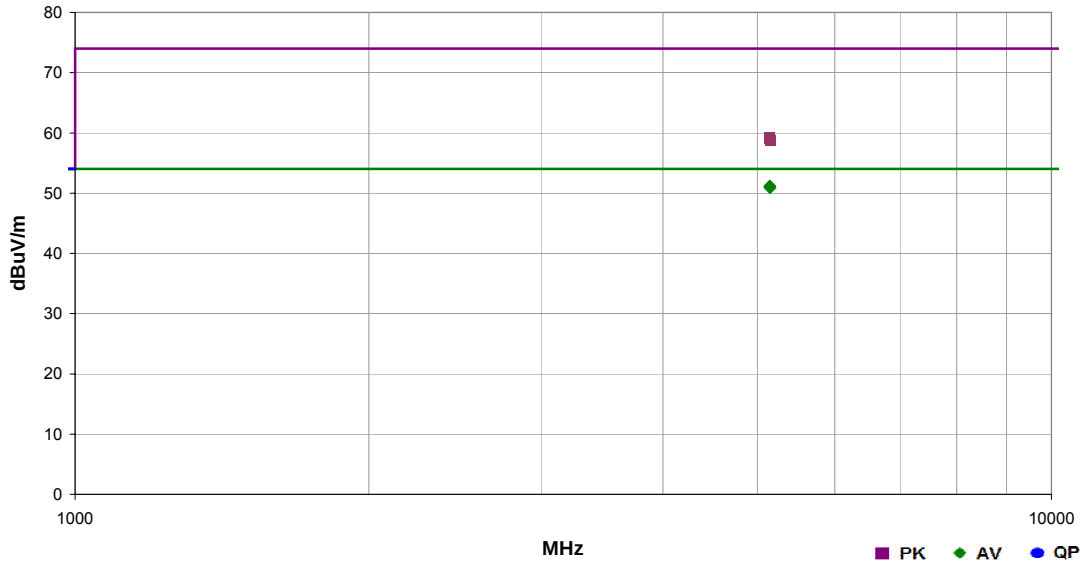
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5149.193	32.6	35.5	1.0	15.0	1.0	0.0	Vert	PK	-9.5	58.5	74.0	-15.5	Ch 36/40, EUT Flat, Ant B, MCS0, 8 dBm
5149.220	32.1	35.5	1.0	126.0	1.0	0.0	Horz	PK	-9.5	58.0	74.0	-16.0	Ch 36/40, EUT Vert, Ant A, MCS0, 8 dBm
5148.420	31.8	35.5	1.0	73.0	1.0	0.0	Horz	PK	-9.5	57.7	74.0	-16.3	Ch 36/40, EUT Vert, Ant AB, MCS0, 8 dBm
5149.990	31.7	35.5	1.0	13.0	1.0	0.0	Horz	PK	-9.5	57.6	74.0	-16.4	Ch 36/40, EUT Vert, Ant B, MCS0, 8 dBm

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	23 °C		
Job Site:	NC01	**Humidity:**	47% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1018 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 36/40, 5190 MHz				
Deviations:	None				
Comments:	5150 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

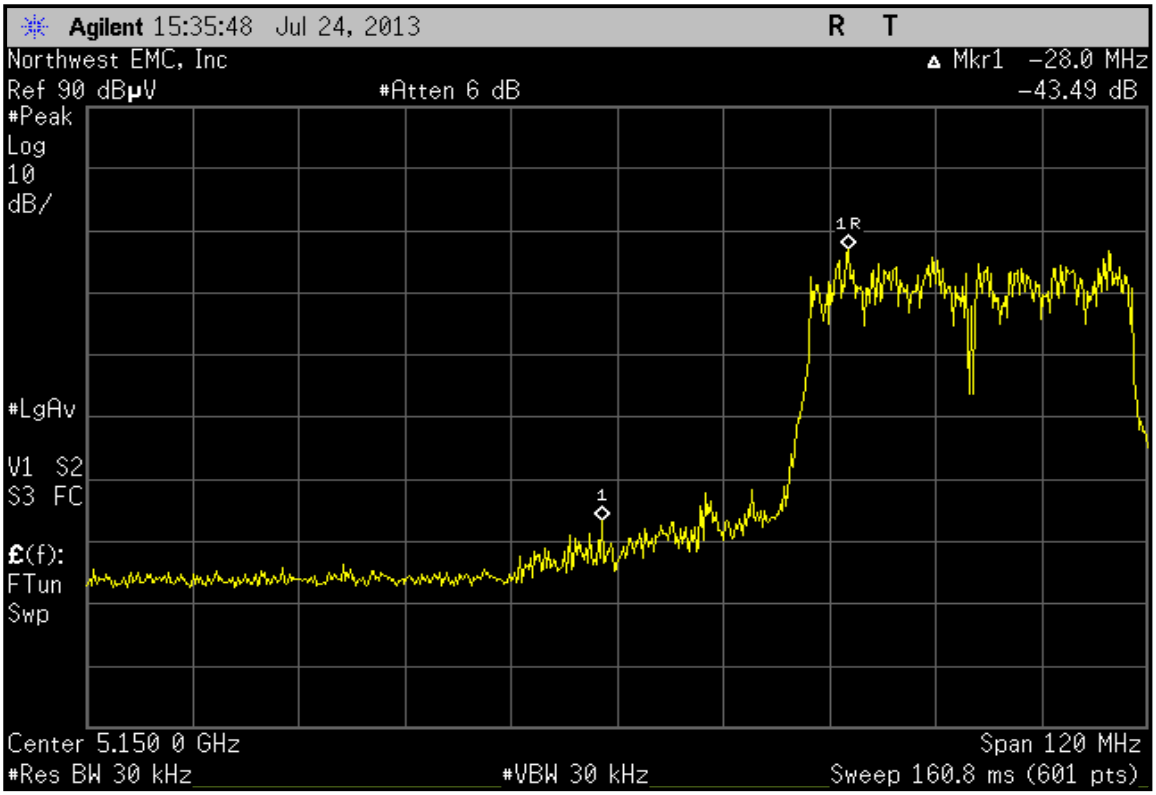
Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	137-140	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass

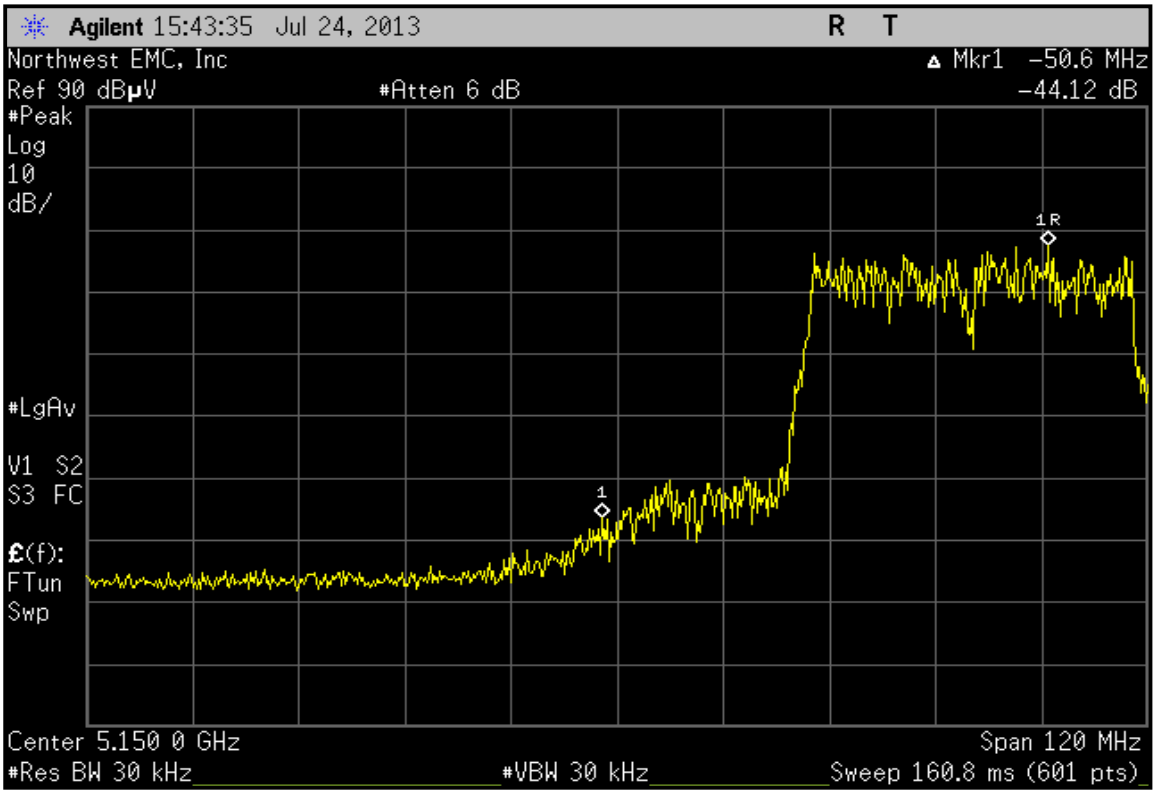


Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5185.670	68.7	35.6	1.0	163.0	1.0	0.0	Vert	AV	-9.5	94.7	54.0		Fundamental @ 8 dBm
													Delta marker: 94.7 - 43.49dBc = 51.21
5148.200			1.0	163.0	1.0	0.0	Vert	AV		51.2	54.0	-2.8	Ch 36/40, EUT Vert, Ant AB, MCS0
5192.000	69.1	35.6	1.0	162.0	1.0	0.0	Vert	AV	-9.5	95.1	54.0		Fundamental @ 8 dBm
													Delta marker: 95.1 - 44.12dBc = 50.98
5148.200			1.0	162.0	1.0	0.0	Vert	AV		51.0	54.0	-3.0	Ch 36/40, EUT Vert, Ant AB, MCS15
5192.000	69.0	35.6	1.0	163.0	1.0	0.0	Vert	AV	-9.5	95.0	54.0		Fundamental @ 8 dBm
													Delta marker: 95 - 44.02dBc = 50.98
5148.200			1.0	163.0	1.0	0.0	Vert	AV		51.0	54.0	-3.0	Ch 36/40, EUT Vert, Ant AB, MCS7
5192.930	68.6	35.6	1.0	162.0	1.0	0.0	Vert	AV	-9.5	94.6	54.0		Fundamental @ 8 dBm
													Delta marker: 94.6 - 43.71dBc = 50.89
5150.000			1.0	162.0	1.0	0.0	Vert	AV		50.9	54.0	-3.1	Ch 36/40, EUT Vert, Ant AB, MCS8
5199.470	77.4	35.6	1.0	162.0	1.0	0.0	Vert	PK	-9.5	103.4	74.0		Fundamental @ 8 dBm
													Delta marker: 103.4 - 44.12dBc = 59.28
5148.20			1.0	162.0	1.0	0.0	Vert	PK		59.3	74.0	-14.7	Ch 36/40, EUT Vert, Ant AB, MCS15
5199.400	77.3	35.6	1.0	163.0	1.0	0.0	Vert	PK	-9.5	103.3	74.0		Fundamental @ 8 dBm
													Delta marker: 103.3 - 44.02dBc = 59.28
5148.200			1.0	163.0	1.0	0.0	Vert	AV		59.3	74.0	-14.7	Ch 36/40, EUT Vert, Ant AB, MCS7
5205.930	76.5	35.6	1.0	163.0	1.0	0.0	Vert	PK	-9.5	102.5	74.0		Fundamental @ 8 dBm
													Delta marker: 102.5 - 43.49dBc = 59.01
5148.20			1.0	163.0	1.0	0.0	Vert	PK		59.0	74.0	-15.0	Ch 36/40, EUT Vert, Ant AB, MCS0
5178.800	76.5	35.5	1.0	162.0	1.0	0.0	Vert	PK	-9.5	102.5	74.0		Fundamental @ 8 dBm
													Delta marker: 102.5 - 43.71dBc = 58.79
5150.00			1.0	162.0	1.0	0.0	Vert	PK		58.8	74.0	-15.2	Ch 36/40, EUT Vert, Ant AB, MCS8

Spurious Radiated Emissions

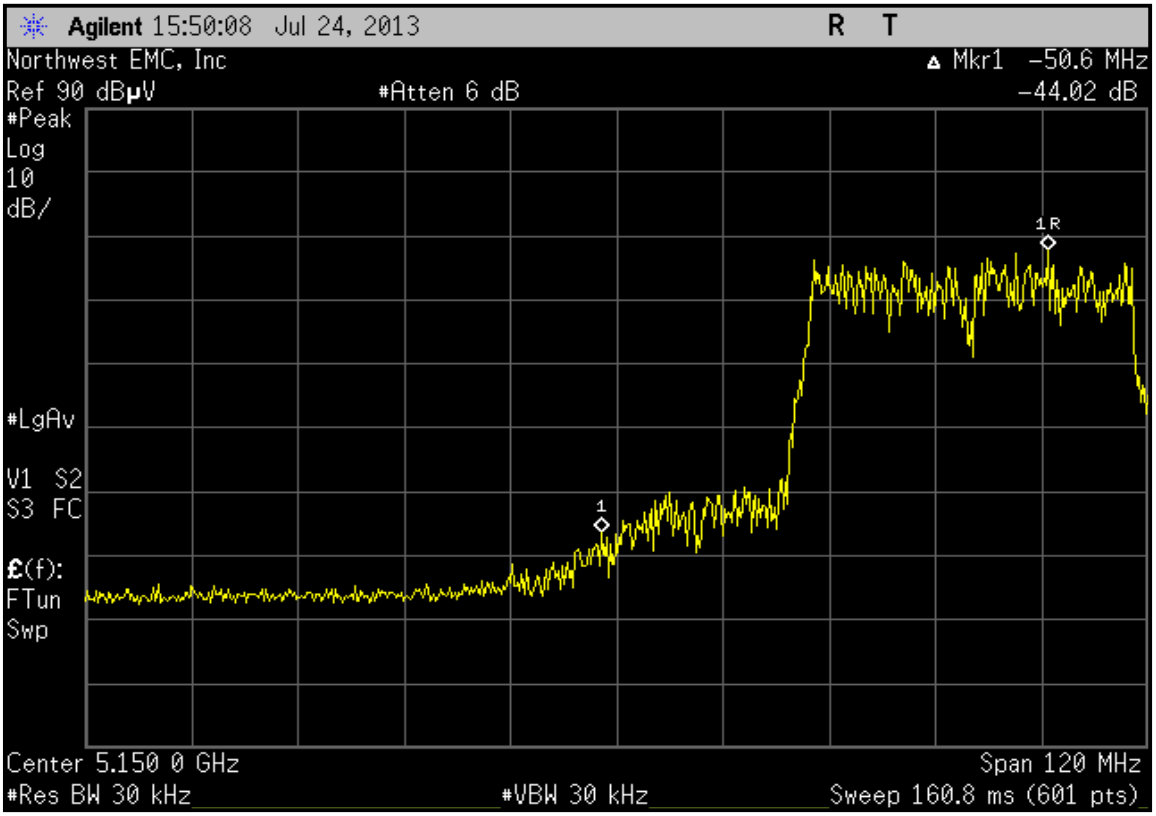


Ch 36/40, EUT Vert, Ant AB, MCS0

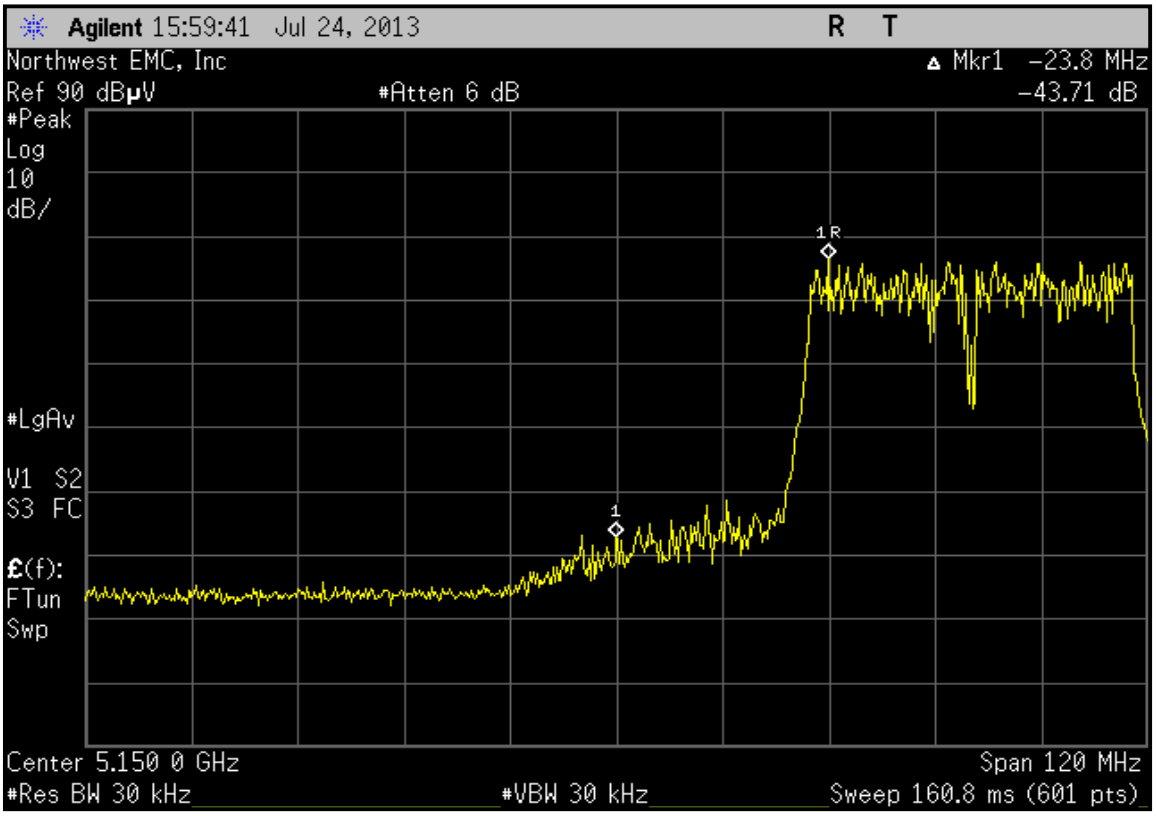


Ch 36/40, EUT Vert, Ant AB, MCS15

Spurious Radiated Emissions



Ch 36/40, EUT Vert, Ant AB, MCS7



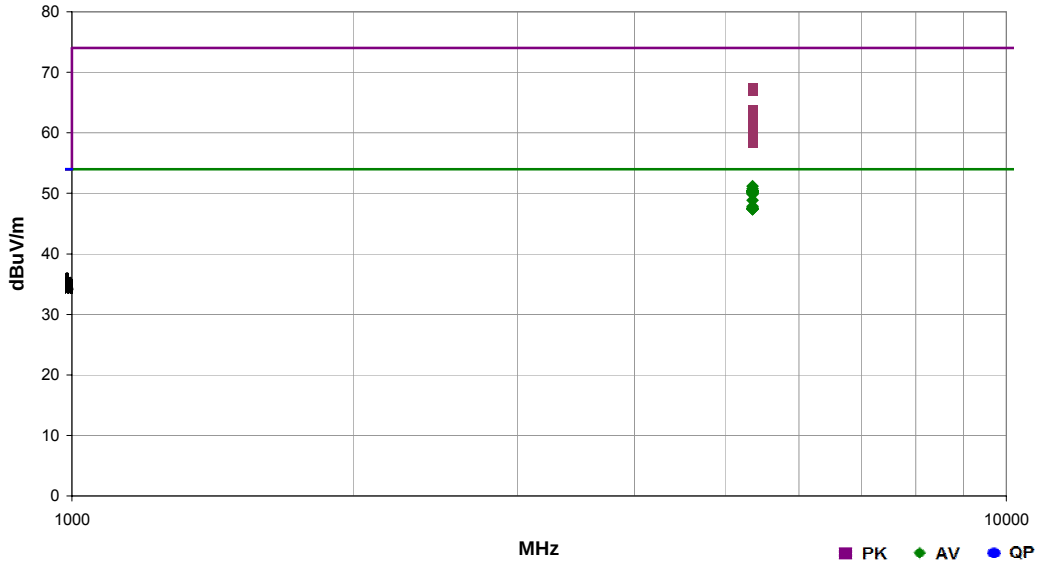
Ch 36/40, EUT Vert, Ant AB, MCS8

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	42% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1017 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 60/64, 5310 MHz				
Deviations:	None				
Comments:	5350 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	142	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5350.573	24.9	35.8	1.0	5.0	1.0	0.0	Horz	AV	-9.5	51.2	54.0	-2.8	Ch 60/64, EUT Horz, Ant AB, MCS8
5351.047	24.5	35.8	1.0	49.0	1.0	0.0	Horz	AV	-9.5	50.8	54.0	-3.2	Ch 60/64, EUT Horz, Ant AB, MCS15, 10Hz Avg
5350.973	24.2	35.8	1.0	162.0	1.0	0.0	Vert	AV	-9.5	50.5	54.0	-3.5	Ch 60/64, EUT Vert, Ant B, MCS7, 10Hz Avg
5350.107	24.2	35.8	1.0	158.0	1.0	0.0	Vert	AV	-9.5	50.5	54.0	-3.5	Ch 60/64, EUT Vert, Ant A, MCS0
5350.043	24.2	35.8	1.0	47.0	1.0	0.0	Horz	AV	-9.5	50.5	54.0	-3.5	Ch 60/64, EUT Horz, Ant AB, MCS0
5350.893	24.1	35.8	1.0	57.0	1.0	0.0	Horz	AV	-9.5	50.4	54.0	-3.6	Ch 60/64, EUT Horz, Ant AB, MCS7, 10Hz Avg
5350.047	24.1	35.8	1.0	151.0	1.0	0.0	Vert	AV	-9.5	50.4	54.0	-3.6	Ch 60/64, EUT Vert, Ant B, MCS0
5350.973	24.0	35.8	1.0	152.0	1.0	0.0	Vert	AV	-9.5	50.3	54.0	-3.7	Ch 60/64, EUT Vert, Ant A, MCS7, 10Hz Avg
5350.027	24.0	35.8	1.0	114.0	1.0	0.0	Vert	AV	-9.5	50.3	54.0	-3.7	Ch 60/64, EUT Vert, Ant AB, MCS0
5350.147	23.9	35.8	1.0	174.0	1.0	0.0	Horz	AV	-9.5	50.2	54.0	-3.8	Ch 60/64, EUT Flat, Ant A, MCS0
5350.213	23.8	35.8	1.0	54.0	1.0	0.0	Horz	AV	-9.5	50.1	54.0	-3.9	Ch 60/64, EUT Horz, Ant B, MCS0
5350.127	23.8	35.8	1.0	174.0	1.0	0.0	Horz	AV	-9.5	50.1	54.0	-3.9	Ch 60/64, EUT Flat, Ant B, MCS0
5350.067	23.8	35.8	1.0	176.0	1.0	0.0	Horz	AV	-9.5	50.1	54.0	-3.9	Ch 60/64, EUT Flat, Ant AB, MCS0
5350.113	23.6	35.8	1.0	7.0	1.0	0.0	Horz	AV	-9.5	49.9	54.0	-4.1	Ch 60/64, EUT Horz, Ant A, MCS0
5350.017	22.6	35.8	1.0	98.0	1.0	0.0	Vert	AV	-9.5	48.9	54.0	-5.1	Ch 60/64, EUT Horz, Ant B, MCS0
5350.027	21.6	35.8	1.0	37.0	1.0	0.0	Vert	AV	-9.5	47.9	54.0	-6.1	Ch 60/64, EUT Horz, Ant AB, MCS0
5350.293	21.3	35.8	1.0	270.0	1.0	0.0	Vert	AV	-9.5	47.6	54.0	-6.4	Ch 60/64, EUT Horz, Ant A, MCS0
5351.563	21.2	35.8	1.0	312.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 60/64, EUT Vert, Ant A, MCS0
5350.970	21.2	35.8	1.0	257.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 60/64, EUT Flat, Ant B, MCS0
5350.237	21.2	35.8	1.0	23.0	1.0	0.0	Horz	AV	-9.5	47.5	54.0	-6.5	Ch 60/64, EUT Vert, Ant B, MCS0
5350.020	21.2	35.8	1.0	222.0	1.0	0.0	Vert	AV	-9.5	47.5	54.0	-6.5	Ch 60/64, EUT Flat, Ant A, MCS0
5351.787	21.1	35.8	1.0	130.0	1.0	0.0	Vert	AV	-9.5	47.4	54.0	-6.6	Ch 60/64, EUT Flat, Ant AB, MCS0
5351.237	21.1	35.8	1.0	11.0	1.0	0.0	Horz	AV	-9.5	47.4	54.0	-6.6	Ch 60/64, EUT Vert, Ant AB, MCS0
5351.100	41.1	35.8	1.0	162.0	1.0	0.0	Vert	PK	-9.5	67.4	74.0	-6.6	Ch 60/64, EUT Vert, Ant B, MCS7
5350.473	41.1	35.8	1.0	57.0	1.0	0.0	Horz	PK	-9.5	67.4	74.0	-6.6	Ch 60/64, EUT Horz, Ant AB, MCS7
5351.917	40.9	35.8	1.0	154.0	1.0	0.0	Vert	PK	-9.5	67.2	74.0	-6.8	Ch 60/64, EUT Vert, Ant A, MCS7
5351.103	40.6	35.8	1.0	49.0	1.0	0.0	Horz	PK	-9.5	66.9	74.0	-7.1	Ch 60/64, EUT Horz, Ant AB, MCS15
5350.303	37.5	35.8	1.0	5.0	1.0	0.0	Horz	PK	-9.5	63.8	74.0	-10.2	Ch 60/64, EUT Horz, Ant AB, MCS8
5350.080	35.9	35.8	1.0	54.0	1.0	0.0	Horz	PK	-9.5	62.2	74.0	-11.8	Ch 60/64, EUT Horz, Ant B, MCS0
5350.437	35.4	35.8	1.0	114.0	1.0	0.0	Vert	PK	-9.5	61.7	74.0	-12.3	Ch 60/64, EUT Vert, Ant AB, MCS0
5350.160	35.4	35.8	1.0	158.0	1.0	0.0	Vert	PK	-9.5	61.7	74.0	-12.3	Ch 60/64, EUT Vert, Ant A, MCS0
5350.143	35.2	35.8	1.0	151.0	1.0	0.0	Vert	PK	-9.5	61.5	74.0	-12.5	Ch 60/64, EUT Vert, Ant B, MCS0
5350.423	35.0	35.8	1.0	174.0	1.0	0.0	Horz	PK	-9.5	61.3	74.0	-12.7	Ch 60/64, EUT Flat, Ant B, MCS0
5350.090	35.0	35.8	1.0	174.0	1.0	0.0	Horz	PK	-9.5	61.3	74.0	-12.7	Ch 60/64, EUT Flat, Ant A, MCS0

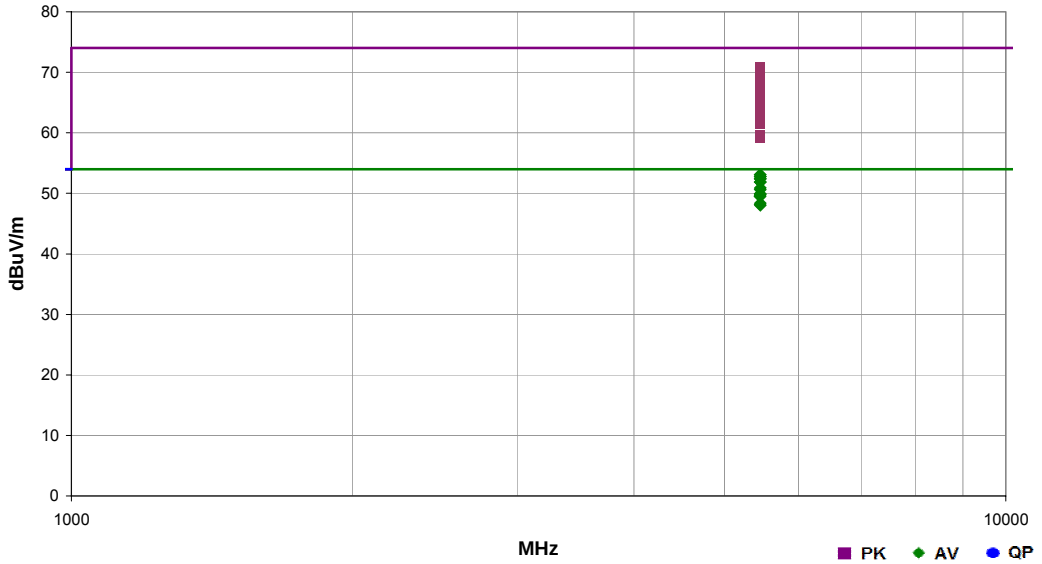
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5350.647	34.8	35.8	1.0	176.0	1.0	0.0	Horz	PK	-9.5	61.1	74.0	-12.9	Ch 60/64, EUT Flat, Ant AB, MCS0
5350.323	34.6	35.8	1.0	47.0	1.0	0.0	Horz	PK	-9.5	60.9	74.0	-13.1	Ch 60/64, EUT Horz, Ant AB, MCS0
5350.947	34.5	35.8	1.0	98.0	1.0	0.0	Vert	PK	-9.5	60.8	74.0	-13.2	Ch 60/64, EUT Horz, Ant B, MCS0
5350.570	34.3	35.8	1.0	7.0	1.0	0.0	Horz	PK	-9.5	60.6	74.0	-13.4	Ch 60/64, EUT Horz, Ant A, MCS0
5350.753	32.9	35.8	1.0	37.0	1.0	0.0	Vert	PK	-9.5	59.2	74.0	-14.8	Ch 60/64, EUT Horz, Ant AB, MCS0
5350.257	32.9	35.8	1.0	130.0	1.0	0.0	Vert	PK	-9.5	59.2	74.0	-14.8	Ch 60/64, EUT Flat, Ant AB, MCS0
5350.830	32.7	35.8	1.0	312.0	1.0	0.0	Horz	PK	-9.5	59.0	74.0	-15.0	Ch 60/64, EUT Vert, Ant A, MCS0
5350.707	32.6	35.8	1.0	222.0	1.0	0.0	Vert	PK	-9.5	58.9	74.0	-15.1	Ch 60/64, EUT Flat, Ant A, MCS0
5351.523	32.5	35.8	1.0	11.0	1.0	0.0	Horz	PK	-9.5	58.8	74.0	-15.2	Ch 60/64, EUT Vert, Ant AB, MCS0
5350.083	32.5	35.8	1.0	270.0	1.0	0.0	Vert	PK	-9.5	58.8	74.0	-15.2	Ch 60/64, EUT Horz, Ant A, MCS0
5350.803	32.4	35.8	1.0	23.0	1.0	0.0	Horz	PK	-9.5	58.7	74.0	-15.3	Ch 60/64, EUT Vert, Ant B, MCS0
5351.617	32.0	35.8	1.0	257.0	1.0	0.0	Vert	PK	-9.5	58.3	74.0	-15.7	Ch 60/64, EUT Flat, Ant B, MCS0

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/24/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	42% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1017 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n, Channel 100/104, 5510 MHz				
Deviations:	None				
Comments:	5460 MHz restricted band edge measurements. See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	143	**Test Distance (m)**	1	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5459.973	26.7	35.9	1.0	162.0	1.0	0.0	Vert	AV	-9.5	53.1	54.0	-0.9	Ch 100/104, EUT Vert, Ant A, MCS0
5459.493	26.7	35.9	1.0	159.0	1.0	0.0	Horz	AV	-9.5	53.1	54.0	-0.9	Ch 100/104, EUT Flat, Ant AB, MCS0
5459.997	26.4	35.9	1.0	6.0	1.0	0.0	Horz	AV	-9.5	52.8	54.0	-1.2	Ch 100/104, EUT Horz, Ant AB, MCS0
5459.867	26.4	35.9	1.0	122.0	1.0	0.0	Vert	AV	-9.5	52.8	54.0	-1.2	Ch 100/104, EUT Vert, Ant AB, MCS15, 10Hz Avg
5459.417	26.4	35.9	1.0	158.0	1.0	0.0	Horz	AV	-9.5	52.8	54.0	-1.2	Ch 100/104, EUT Flat, Ant B, MCS0
5459.993	26.0	35.9	1.0	162.0	1.0	0.0	Horz	AV	-9.5	52.4	54.0	-1.6	Ch 100/104, EUT Flat, Ant A, MCS0
5459.997	26.0	35.9	1.0	146.0	1.0	0.0	Vert	AV	-9.5	52.4	54.0	-1.6	Ch 100/104, EUT Vert, Ant AB, MCS8, 10Hz Avg
5458.517	26.0	35.9	1.0	124.0	1.0	0.0	Vert	AV	-9.5	52.4	54.0	-1.6	Ch 100/104, EUT Vert, Ant AB, MCS7, 10Hz Avg
5459.950	25.5	35.9	1.0	23.0	1.0	0.0	Horz	AV	-9.5	51.9	54.0	-2.1	Ch 100/104, EUT Horz, Ant A, MCS0
5459.763	25.5	35.9	1.0	59.0	1.0	0.0	Horz	AV	-9.5	51.9	54.0	-2.1	Ch 100/104, EUT Horz, Ant B, MCS0
5458.103	25.5	35.9	1.0	152.0	1.0	0.0	Horz	AV	-9.5	51.9	54.0	-2.1	Ch 100/104, EUT Flat, Ant B, MCS7
5460.000	24.5	35.9	1.0	148.0	1.0	0.0	Vert	AV	-9.5	50.9	54.0	-3.1	Ch 100/104, EUT Vert, Ant A, MCS7, 10Hz Avg
5458.807	44.4	35.9	1.0	124.0	1.0	0.0	Vert	PK	-9.5	70.8	74.0	-3.2	Ch 100/104, EUT Vert, Ant AB, MCS7
5459.260	24.3	35.9	1.0	163.0	1.0	0.0	Vert	AV	-9.5	50.7	54.0	-3.3	Ch 100/104, EUT Vert, Ant AB, MCS0, 10Hz Avg
5459.757	24.2	35.9	1.0	96.0	1.0	0.0	Vert	AV	-9.5	50.6	54.0	-3.4	Ch 100/104, EUT Horz, Ant B, MCS0
5459.957	23.5	35.9	1.0	92.0	1.0	0.0	Vert	AV	-9.5	49.9	54.0	-4.1	Ch 100/104, EUT Vert, Ant B, MCS0
5459.177	23.5	35.9	1.0	96.0	1.0	0.0	Vert	AV	-9.5	49.9	54.0	-4.1	Ch 100/104, EUT Horz, Ant A, MCS0
5459.997	23.4	35.9	1.0	95.0	1.0	0.0	Vert	AV	-9.5	49.8	54.0	-4.2	Ch 100/104, EUT Horz, Ant AB, MCS0
5459.270	23.2	35.9	1.0	81.0	1.0	0.0	Vert	AV	-9.5	49.6	54.0	-4.4	Ch 100/104, EUT Flat, Ant A, MCS0
5459.343	23.1	35.9	1.0	71.0	1.0	0.0	Vert	AV	-9.5	49.5	54.0	-4.5	Ch 100/104, EUT Flat, Ant AB, MCS0
5459.263	23.1	35.9	1.0	72.0	1.0	0.0	Vert	AV	-9.5	49.5	54.0	-4.5	Ch 100/104, EUT Flat, Ant B, MCS0
5458.580	43.0	35.9	1.0	148.0	1.0	0.0	Vert	PK	-9.5	69.4	74.0	-4.6	Ch 100/104, EUT Vert, Ant A, MCS7
5458.007	42.7	35.9	1.0	122.0	1.0	0.0	Vert	PK	-9.5	69.1	74.0	-4.9	Ch 100/104, EUT Vert, Ant AB, MCS15
5459.973	22.0	35.9	1.0	66.0	1.0	0.0	Horz	AV	-9.5	48.4	54.0	-5.6	Ch 100/104, EUT Vert, Ant AB, MCS0
5459.473	21.8	35.9	1.0	70.0	1.0	0.0	Horz	AV	-9.5	48.2	54.0	-5.8	Ch 100/104, EUT Vert, Ant B, MCS0
5459.917	21.6	35.9	1.0	15.0	1.0	0.0	Horz	AV	-9.5	48.0	54.0	-6.0	Ch 100/104, EUT Vert, Ant A, MCS0
5458.470	41.0	35.9	1.0	146.0	1.0	0.0	Vert	PK	-9.5	67.4	74.0	-6.6	Ch 100/104, EUT Vert, Ant AB, MCS8
5459.873	40.4	35.9	1.0	162.0	1.0	0.0	Vert	PK	-9.5	66.8	74.0	-7.2	Ch 100/104, EUT Vert, Ant A, MCS0
5459.820	40.4	35.9	1.0	144.0	1.0	0.0	Vert	PK	-9.5	66.8	74.0	-7.2	Ch 100/104, EUT Vert, Ant AB, MCS0
5459.787	39.7	35.9	1.0	6.0	1.0	0.0	Horz	PK	-9.5	66.1	74.0	-7.9	Ch 100/104, EUT Horz, Ant AB, MCS0
5459.723	39.6	35.9	1.0	159.0	1.0	0.0	Horz	PK	-9.5	66.0	74.0	-8.0	Ch 100/104, EUT Flat, Ant AB, MCS0
5459.823	39.6	35.9	1.0	158.0	1.0	0.0	Horz	PK	-9.5	66.0	74.0	-8.0	Ch 100/104, EUT Flat, Ant B, MCS0
5459.557	39.3	35.9	1.0	152.0	1.0	0.0	Horz	PK	-9.5	65.7	74.0	-8.3	Ch 100/104, EUT Flat, Ant B, MCS7
5459.907	39.1	35.9	1.0	162.0	1.0	0.0	Horz	PK	-9.5	65.5	74.0	-8.5	Ch 100/104, EUT Flat, Ant A, MCS0

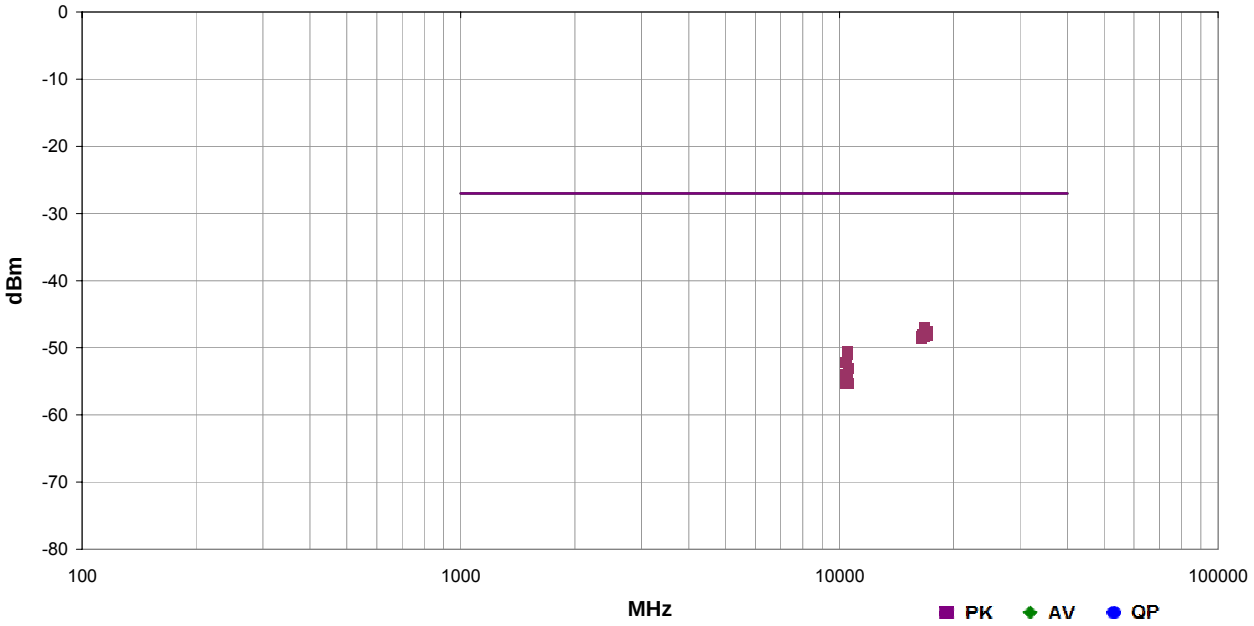
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
5459.763	38.9	35.9	1.0	23.0	1.0	0.0	Horz	PK	-9.5	65.3	74.0	-8.7	Ch 100/104, EUT Horz, Ant A, MCS0
5459.927	38.6	35.9	1.0	59.0	1.0	0.0	Horz	PK	-9.5	65.0	74.0	-9.0	Ch 100/104, EUT Horz, Ant B, MCS0
5459.993	37.2	35.9	1.0	96.0	1.0	0.0	Vert	PK	-9.5	63.6	74.0	-10.4	Ch 100/104, EUT Horz, Ant B, MCS0
5459.983	36.2	35.9	1.0	92.0	1.0	0.0	Vert	PK	-9.5	62.6	74.0	-11.4	Ch 100/104, EUT Vert, Ant B, MCS0
5459.617	35.7	35.9	1.0	96.0	1.0	0.0	Vert	PK	-9.5	62.1	74.0	-11.9	Ch 100/104, EUT Horz, Ant A, MCS0
5459.697	35.6	35.9	1.0	72.0	1.0	0.0	Vert	PK	-9.5	62.0	74.0	-12.0	Ch 100/104, EUT Flat, Ant B, MCS0
5459.463	35.5	35.9	1.0	71.0	1.0	0.0	Vert	PK	-9.5	61.9	74.0	-12.1	Ch 100/104, EUT Flat, Ant AB, MCS0
5459.667	35.4	35.9	1.0	81.0	1.0	0.0	Vert	PK	-9.5	61.8	74.0	-12.2	Ch 100/104, EUT Flat, Ant A, MCS0
5459.573	35.0	35.9	1.0	66.0	1.0	0.0	Horz	PK	-9.5	61.4	74.0	-12.6	Ch 100/104, EUT Vert, Ant AB, MCS0
5459.560	35.0	35.9	1.0	95.0	1.0	0.0	Vert	PK	-9.5	61.4	74.0	-12.6	Ch 100/104, EUT Horz, Ant AB, MCS0
5459.920	33.2	35.9	1.0	70.0	1.0	0.0	Horz	PK	-9.5	59.6	74.0	-14.4	Ch 100/104, EUT Vert, Ant B, MCS0
5459.430	32.8	35.9	1.0	15.0	1.0	0.0	Horz	PK	-9.5	59.2	74.0	-14.8	Ch 100/104, EUT Vert, Ant A, MCS0

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/22/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	51% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1021 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n				
Deviations:	None				
Comments:	Field Strength measurements. See comments below for EUT orientation, channel, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	87-90	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



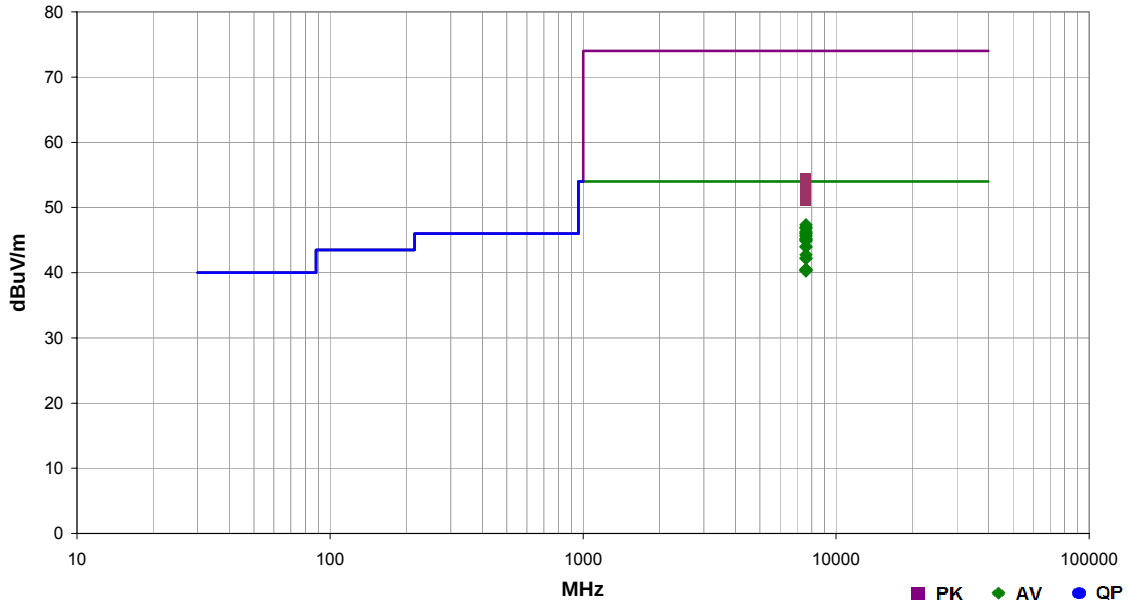
Freq (MHz)	Antenna Height (meters)	Azimuth (Degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	(dBuV/m)
16738.990	1.2	5.0	Vert	PK	2.004E-08	-47.0	-27.0	-20.0	Ch 116, EUT Flat, Ant A, 6 Mbps
17100.640	1.2	136.0	Vert	PK	1.711E-08	-47.7	-27.0	-20.7	Ch 140, EUT Flat, Ant A, 6 Mbps
17008.330	1.2	205.0	Vert	PK	1.699E-08	-47.7	-27.0	-20.7	Ch 132/136, EUT Flat, Ant A, MCS0
17009.780	1.2	156.0	Horz	PK	1.587E-08	-48.0	-27.0	-21.0	Ch 132/136, EUT Flat, Ant A, MCS0
16530.250	1.2	99.0	Horz	PK	1.555E-08	-48.1	-27.0	-21.1	Ch 100/104, EUT Flat, Ant A, MCS0
16529.240	1.2	215.0	Vert	PK	1.553E-08	-48.1	-27.0	-21.1	Ch 100/104, EUT Flat, Ant A, MCS0
17097.860	1.2	144.0	Horz	PK	1.522E-08	-48.2	-27.0	-21.2	Ch 140, EUT Flat, Ant A, 6 Mbps
16740.090	2.7	232.0	Horz	PK	1.487E-08	-48.3	-27.0	-21.3	Ch 116, EUT Flat, Ant A, 6 Mbps
16498.730	1.2	29.0	Vert	PK	1.468E-08	-48.3	-27.0	-21.3	Ch 100, EUT Flat, Ant A, 6 Mbps
16499.130	1.2	64.0	Horz	PK	1.402E-08	-48.5	-27.0	-21.5	Ch 100, EUT Flat, Ant A, 6 Mbps
10480.150	1.2	207.0	Vert	PK	8.833E-09	-50.5	-27.0	-23.5	Ch 48, EUT Flat, Ant A, 6 Mbps
10519.600	1.2	210.0	Vert	PK	7.959E-09	-51.0	-27.0	-24.0	Ch 52, EUT Flat, Ant A, 6 Mbps
10458.470	1.2	181.0	Vert	PK	6.111E-09	-52.1	-27.0	-25.1	Ch 44/48, EUT Flat, Ant A, MCS0
10360.370	1.2	219.0	Vert	PK	5.972E-09	-52.2	-27.0	-25.2	Ch 36, EUT Flat, Ant A, 6 Mbps
10538.450	1.2	208.0	Vert	PK	4.962E-09	-53.0	-27.0	-26.0	Ch 52/56, EUT Flat, Ant A, MCS0
10381.170	1.2	163.0	Vert	PK	4.038E-09	-53.9	-27.0	-26.9	Ch 36/40, EUT Flat, Ant A, MCS0
10458.680	1.2	307.0	Horz	PK	3.946E-09	-54.0	-27.0	-27.0	Ch 44/48, EUT Flat, Ant A, MCS0
10360.100	1.2	203.0	Horz	PK	3.856E-09	-54.1	-27.0	-27.1	Ch 36, EUT Flat, Ant A, 6 Mbps
10481.060	1.2	266.0	Horz	PK	3.682E-09	-54.3	-27.0	-27.3	Ch 48, EUT Flat, Ant A, 6 Mbps
10520.130	1.2	135.0	Horz	PK	3.476E-09	-54.6	-27.0	-27.6	Ch 52, EUT Flat, Ant A, 6 Mbps
10542.030	1.2	205.0	Horz	PK	2.928E-09	-55.3	-27.0	-28.3	Ch 52/56, EUT Flat, Ant A, MCS0
10380.110	2.9	27.0	Horz	PK	2.925E-09	-55.3	-27.0	-28.3	Ch 36/40, EUT Flat, Ant A, MCS0

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/22/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	51% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1021 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n				
Deviations:	None				
Comments:	See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	86,91	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
7600.050	34.5	12.8	1.0	290.0	3.0	0.0	Horz	AV	0.0	47.3	54.0	-6.7	Ch 140, EUT Horz, Ant AB, MCS15
7600.020	34.2	12.8	1.1	151.0	3.0	0.0	Horz	AV	0.0	47.0	54.0	-7.0	Ch 140, EUT Flat, Ant A, 6 Mbps
7599.985	34.0	12.8	1.1	291.0	3.0	0.0	Horz	AV	0.0	46.8	54.0	-7.2	Ch 140, EUT Horz, Ant A, 6 Mbps
7600.005	34.0	12.8	1.1	145.0	3.0	0.0	Horz	AV	0.0	46.8	54.0	-7.2	Ch 140. EUT Flat, Ant A, MCS7
7600.020	33.5	12.8	1.1	146.0	3.0	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Ch 140, EUT Flat, Ant A, MCS0
7599.960	33.3	12.8	1.0	230.0	3.0	0.0	Horz	AV	0.0	46.1	54.0	-7.9	Ch 140, EUT Flat, Ant A, 36 Mbps
7600.000	33.2	12.8	1.0	145.0	3.0	0.0	Horz	AV	0.0	46.0	54.0	-8.0	Ch 140, EUT Flat, Ant A, 54 Mbps
7599.970	33.1	12.8	1.0	145.0	3.0	0.0	Horz	AV	0.0	45.9	54.0	-8.1	Ch 140, EUT Flat, Ant AB, MCS15
7599.980	32.8	12.8	1.0	191.0	3.0	0.0	Vert	AV	0.0	45.6	54.0	-8.4	Ch 140, EUT Flat, Ant A, 36 Mbps
7600.015	32.8	12.8	1.0	191.0	3.0	0.0	Vert	AV	0.0	45.6	54.0	-8.4	Ch 140, EUT Flat, Ant A, 54 Mbps
7600.025	32.4	12.8	1.0	190.0	3.0	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Ch 140. EUT Flat, Ant A, MCS7
7600.000	32.3	12.8	1.0	191.0	3.0	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Ch 140, EUT Flat, Ant AB, MCS15
7599.930	32.2	12.8	1.0	87.0	3.0	0.0	Vert	AV	0.0	45.0	54.0	-9.0	Ch 140, EUT Vert, Ant AB, MCS15
7600.040	32.1	12.8	1.0	192.0	3.0	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Ch 140, EUT Flat, Ant A, MCS0
7600.005	32.0	12.8	1.2	191.0	3.0	0.0	Vert	AV	0.0	44.8	54.0	-9.2	Ch 140, EUT Flat, Ant A, 6 Mbps
7599.970	31.2	12.8	1.2	257.0	3.0	0.0	Vert	AV	0.0	44.0	54.0	-10.0	Ch 140, EUT Horz, Ant A, 6 Mbps
7599.970	31.1	12.8	1.0	355.0	3.0	0.0	Vert	AV	0.0	43.9	54.0	-10.1	Ch 140, EUT Horz, Ant AB, MCS15
7600.040	29.9	12.8	1.2	309.0	3.0	0.0	Horz	AV	0.0	42.7	54.0	-11.3	Ch 140, EUT Vert, Ant A, 6 Mbps
7599.975	29.4	12.8	1.2	60.0	3.0	0.0	Vert	AV	0.0	42.2	54.0	-11.8	Ch 140, EUT Vert, Ant A, 6 Mbps
7599.950	29.3	12.8	1.0	53.0	3.0	0.0	Horz	AV	0.0	42.1	54.0	-11.9	Ch 140, EUT Vert, Ant AB, MCS15
7600.175	27.7	12.8	1.0	261.0	3.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	Ch 140, EUT Horz, Ant B, MCS7
7600.025	27.6	12.8	1.0	292.0	3.0	0.0	Vert	AV	0.0	40.4	54.0	-13.6	Ch 140, EUT Horz, Ant B, MCS7
7600.130	27.6	12.8	1.0	58.0	3.0	0.0	Horz	AV	0.0	40.4	54.0	-13.6	Ch 140, EUT Vert, Ant B, MCS7
7599.290	27.5	12.8	1.0	325.0	3.0	0.0	Horz	AV	0.0	40.3	54.0	-13.7	Ch 140, EUT Flat, Ant B, MCS7
7599.770	27.5	12.8	1.0	341.0	3.0	0.0	Vert	AV	0.0	40.3	54.0	-13.7	Ch 140, EUT Flat, Ant B, MCS7
7601.090	27.4	12.8	1.1	26.0	3.0	0.0	Vert	AV	0.0	40.2	54.0	-13.8	Ch 140, EUT Vert, Ant B, MCS7
7600.220	41.6	12.8	1.0	145.0	3.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	Ch 140, EUT Flat, Ant A, 54 Mbps

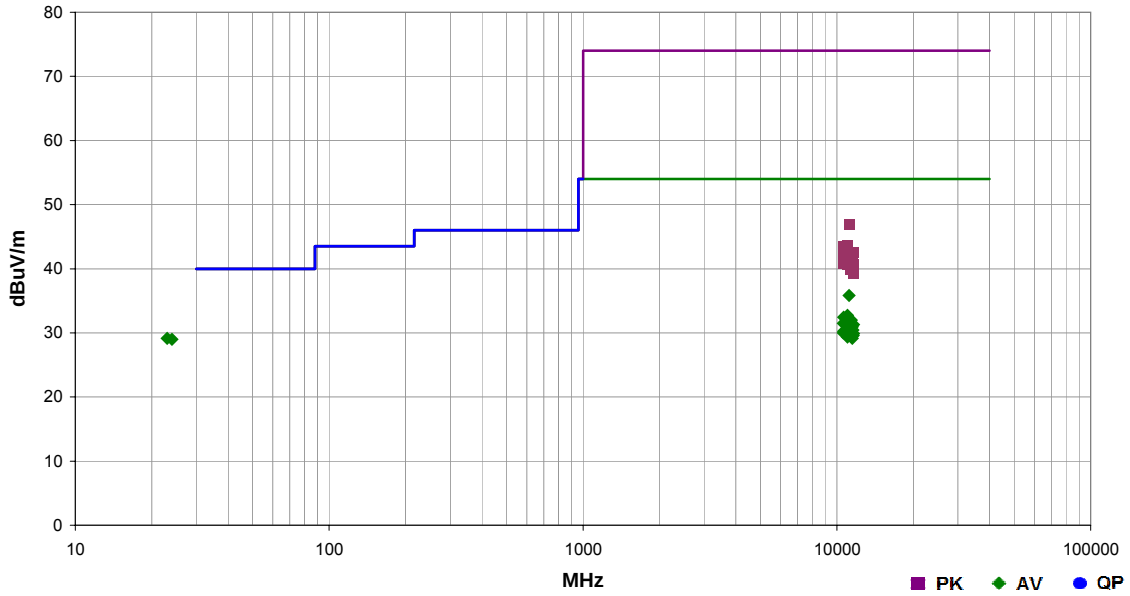
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
7600.165	41.5	12.8	1.1	146.0	3.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Ch 140, EUT Flat, Ant A, MCS0
7600.095	41.3	12.8	1.1	151.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Ch 140, EUT Flat, Ant A, 6 Mbps
7600.170	41.3	12.8	1.1	291.0	3.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Ch 140, EUT Horz, Ant A, 6 Mbps
7600.295	41.3	12.8	1.0	192.0	3.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Ch 140, EUT Flat, Ant A, MCS0
7600.500	41.1	12.8	1.1	145.0	3.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	Ch 140. EUT Flat, Ant A, MCS7
7599.935	40.9	12.8	1.0	290.0	3.0	0.0	Horz	PK	0.0	53.7	74.0	-20.3	Ch 140, EUT Horz, Ant AB, MCS15
7600.070	40.8	12.8	1.0	191.0	3.0	0.0	Vert	PK	0.0	53.6	74.0	-20.4	Ch 140, EUT Flat, Ant AB, MCS15
7599.870	40.7	12.8	1.0	191.0	3.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Ch 140, EUT Flat, Ant A, 36 Mbps
7599.770	40.6	12.8	1.0	145.0	3.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Ch 140, EUT Flat, Ant AB, MCS15
7600.305	40.6	12.8	1.0	191.0	3.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	Ch 140, EUT Flat, Ant A, 54 Mbps
7600.330	40.5	12.8	1.0	230.0	3.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	Ch 140, EUT Flat, Ant A, 36 Mbps
7599.715	40.4	12.8	1.0	190.0	3.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	Ch 140. EUT Flat, Ant A, MCS7
7600.170	40.4	12.8	1.0	355.0	3.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	Ch 140, EUT Horz, Ant AB, MCS15
7599.755	40.3	12.8	1.2	191.0	3.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Ch 140, EUT Flat, Ant A, 6 Mbps
7599.870	40.3	12.8	1.0	87.0	3.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Ch 140, EUT Vert, Ant AB, MCS15
7600.345	40.3	12.8	1.2	309.0	3.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	Ch 140, EUT Vert, Ant A, 6 Mbps
7599.485	40.1	12.8	1.2	257.0	3.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Ch 140, EUT Horz, Ant A, 6 Mbps
7600.620	39.6	12.8	1.2	60.0	3.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	Ch 140, EUT Vert, Ant A, 6 Mbps
7600.095	39.0	12.8	1.0	292.0	3.0	0.0	Vert	PK	0.0	51.8	74.0	-22.2	Ch 140, EUT Horz, Ant B, MCS7
7600.175	38.9	12.8	1.0	53.0	3.0	0.0	Horz	PK	0.0	51.7	74.0	-22.3	Ch 140, EUT Vert, Ant AB, MCS15
7601.405	38.8	12.8	1.0	58.0	3.0	0.0	Horz	PK	0.0	51.6	74.0	-22.4	Ch 140, EUT Vert, Ant B, MCS7
7598.760	38.5	12.8	1.0	341.0	3.0	0.0	Vert	PK	0.0	51.3	74.0	-22.7	Ch 140, EUT Flat, Ant B, MCS7
7599.340	38.4	12.8	1.1	26.0	3.0	0.0	Vert	PK	0.0	51.2	74.0	-22.8	Ch 140, EUT Vert, Ant B, MCS7
7600.595	38.4	12.8	1.0	261.0	3.0	0.0	Horz	PK	0.0	51.2	74.0	-22.8	Ch 140, EUT Horz, Ant B, MCS7
7599.820	38.2	12.8	1.0	325.0	3.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	Ch 140, EUT Flat, Ant B, MCS7

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/22/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	51% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1021 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n				
Deviations:	None				
Comments:	See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	87-90	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
11160.030	38.8	-2.9	1.2	181.0	3.0	0.0	Vert	AV	0.0	35.9	54.0	-18.1	Ch 116, EUT Flat, Ant A, 6 Mbps
11000.090	36.0	-3.3	1.2	179.0	3.0	0.0	Vert	AV	0.0	32.7	54.0	-21.3	Ch 100, EUT Flat, Ant A, 6 Mbps
10640.010	35.3	-2.9	1.2	164.0	3.0	0.0	Vert	AV	0.0	32.4	54.0	-21.6	Ch 64, EUT Flat, Ant A, 6 Mbps
11018.380	35.5	-3.2	1.2	178.0	3.0	0.0	Vert	AV	0.0	32.3	54.0	-21.7	Ch 100/104, EUT Flat, Ant A, MCS0
11399.910	35.1	-3.1	1.2	179.0	3.0	0.0	Vert	AV	0.0	32.0	54.0	-22.0	Ch 140, EUT Flat, Ant A, 6 Mbps
10620.230	34.4	-2.9	1.2	168.0	3.0	0.0	Vert	AV	0.0	31.5	54.0	-22.5	Ch 60/64, EUT Flat, Ant A, MCS0
11338.270	34.4	-3.0	1.2	181.0	3.0	0.0	Vert	AV	0.0	31.4	54.0	-22.6	Ch 132/136, EUT Flat, Ant A, MCS0
11649.910	34.2	-2.9	1.2	171.0	3.0	0.0	Vert	AV	0.0	31.3	54.0	-22.7	Ch 165, EUT Flat, Ant A, 6 Mbps
11489.930	34.3	-3.3	1.2	179.0	3.0	0.0	Vert	AV	0.0	31.0	54.0	-23.0	Ch 149, EUT Flat, Ant A, 6 Mbps
11570.160	33.6	-3.2	1.2	182.0	3.0	0.0	Vert	AV	0.0	30.4	54.0	-23.6	Ch 157, EUT Flat, Ant A, 6 Mbps
11158.130	33.2	-3.0	1.2	330.0	3.0	0.0	Horz	AV	0.0	30.2	54.0	-23.8	Ch 116, EUT Flat, Ant A, 6 Mbps
10640.250	33.1	-2.9	1.2	19.0	3.0	0.0	Horz	AV	0.0	30.2	54.0	-23.8	Ch 64, EUT Flat, Ant A, 6 Mbps
11002.080	33.4	-3.3	1.8	169.0	3.0	0.0	Horz	AV	0.0	30.1	54.0	-23.9	Ch 100, EUT Flat, Ant A, 6 Mbps
10620.320	32.9	-2.9	1.2	1.0	3.0	0.0	Horz	AV	0.0	30.0	54.0	-24.0	Ch 60/64, EUT Flat, Ant A, MCS0
11649.950	32.8	-2.9	1.2	245.0	3.0	0.0	Horz	AV	0.0	29.9	54.0	-24.1	Ch 165, EUT Flat, Ant A, 6 Mbps
11402.280	33.0	-3.1	1.2	54.0	3.0	0.0	Horz	AV	0.0	29.9	54.0	-24.1	Ch 140, EUT Flat, Ant A, 6 Mbps
11508.360	33.2	-3.3	1.2	179.0	3.0	0.0	Vert	AV	0.0	29.9	54.0	-24.1	Ch 149/153, EUT Flat, Ant A, MCS0
11588.220	32.7	-3.1	1.2	181.0	3.0	0.0	Vert	AV	0.0	29.6	54.0	-24.4	Ch 157/161, EUT Flat, Ant A, MCS0
11489.100	32.9	-3.3	1.2	188.0	3.0	0.0	Horz	AV	0.0	29.6	54.0	-24.4	Ch 149, EUT Flat, Ant A, 6 Mbps
11342.180	32.5	-3.0	1.2	274.0	3.0	0.0	Horz	AV	0.0	29.5	54.0	-24.5	Ch 132/136, EUT Flat, Ant A, MCS0
11022.390	32.6	-3.2	1.2	358.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	Ch 100/104, EUT Flat, Ant A, MCS0
11508.300	32.5	-3.3	1.2	181.0	3.0	0.0	Horz	AV	0.0	29.2	54.0	-24.8	Ch 149/153, EUT Flat, Ant A, MCS0
11571.090	32.3	-3.2	1.2	281.0	3.0	0.0	Horz	AV	0.0	29.1	54.0	-24.9	Ch 157, EUT Flat, Ant A, 6 Mbps
11587.800	32.1	-3.1	1.2	56.0	3.0	0.0	Horz	AV	0.0	29.0	54.0	-25.0	Ch 157/161, EUT Flat, Ant A, MCS0
11160.830	49.9	-2.9	1.2	181.0	3.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Ch 116, EUT Flat, Ant A, 6 Mbps
11000.880	46.9	-3.3	1.2	179.0	3.0	0.0	Vert	PK	0.0	43.6	74.0	-30.4	Ch 100, EUT Flat, Ant A, 6 Mbps
10640.170	46.3	-2.9	1.2	164.0	3.0	0.0	Vert	PK	0.0	43.4	74.0	-30.6	Ch 64, EUT Flat, Ant A, 6 Mbps
11650.110	45.4	-2.9	1.2	171.0	3.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	Ch 165, EUT Flat, Ant A, 6 Mbps

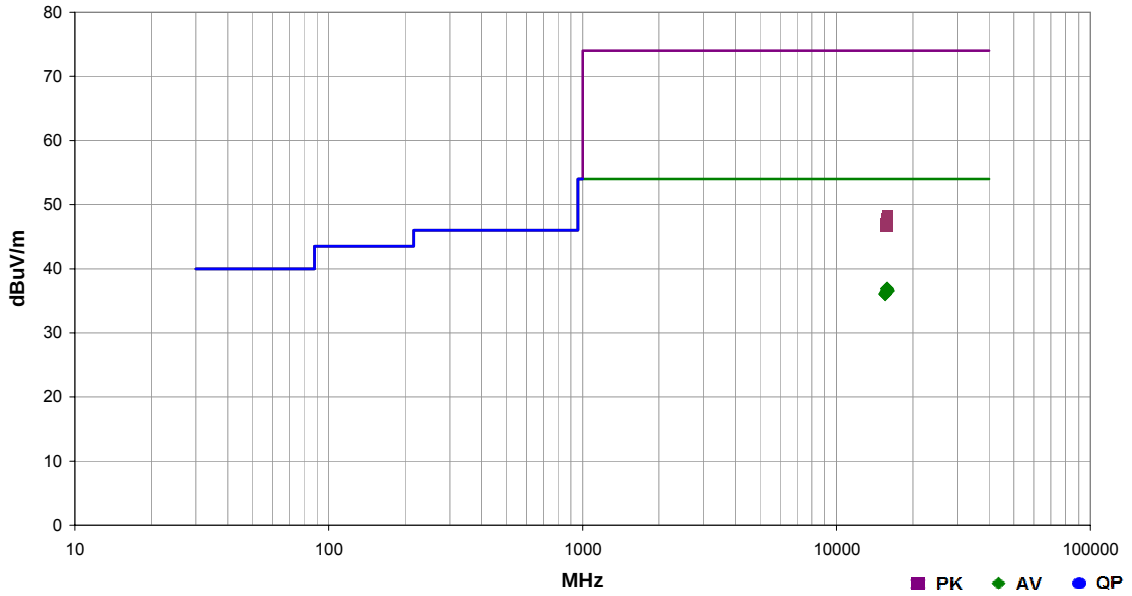
Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
11021.290	45.7	-3.2	1.2	178.0	3.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	Ch 100/104, EUT Flat, Ant A, MCS0
11402.060	45.5	-3.1	1.2	179.0	3.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	Ch 140, EUT Flat, Ant A, 6 Mbps
11490.190	45.7	-3.3	1.2	179.0	3.0	0.0	Vert	PK	0.0	42.4	74.0	-31.6	Ch 149, EUT Flat, Ant A, 6 Mbps
11489.240	45.6	-3.3	1.2	188.0	3.0	0.0	Horz	PK	0.0	42.3	74.0	-31.7	Ch 149, EUT Flat, Ant A, 6 Mbps
11338.130	45.2	-3.0	1.2	181.0	3.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	Ch 132/136, EUT Flat, Ant A, MCS0
11002.360	45.3	-3.3	1.8	169.0	3.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	Ch 100, EUT Flat, Ant A, 6 Mbps
10622.480	44.8	-2.9	1.2	168.0	3.0	0.0	Vert	PK	0.0	41.9	74.0	-32.1	Ch 60/64, EUT Flat, Ant A, MCS0
10637.970	44.1	-2.9	1.2	19.0	3.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	Ch 64, EUT Flat, Ant A, 6 Mbps
10618.580	43.8	-2.9	1.2	1.0	3.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	Ch 60/64, EUT Flat, Ant A, MCS0
11400.160	43.9	-3.1	1.2	54.0	3.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Ch 140, EUT Flat, Ant A, 6 Mbps
11161.250	43.7	-2.9	1.2	330.0	3.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Ch 116, EUT Flat, Ant A, 6 Mbps
11650.260	43.6	-2.9	1.2	245.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Ch 165, EUT Flat, Ant A, 6 Mbps
11020.820	43.9	-3.2	1.2	358.0	3.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Ch 100/104, EUT Flat, Ant A, MCS0
11569.600	43.8	-3.2	1.2	182.0	3.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	Ch 157, EUT Flat, Ant A, 6 Mbps
11588.440	43.7	-3.1	1.2	181.0	3.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	Ch 157/161, EUT Flat, Ant A, MCS0
11508.580	43.7	-3.3	1.2	179.0	3.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Ch 149/153, EUT Flat, Ant A, MCS0
11570.630	43.2	-3.2	1.2	281.0	3.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	Ch 157, EUT Flat, Ant A, 6 Mbps
11511.380	43.3	-3.3	1.2	181.0	3.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	Ch 149/153, EUT Flat, Ant A, MCS0
11341.480	42.8	-3.0	1.2	274.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Ch 132/136, EUT Flat, Ant A, MCS0
11588.980	42.4	-3.1	1.2	56.0	3.0	0.0	Horz	PK	0.0	39.3	74.0	-34.7	Ch 157/161, EUT Flat, Ant A, MCS0

Spurious Radiated Emissions

Work Order:	MCSO1665	**Date:**	07/22/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC01	**Humidity:**	51% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1021 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	2				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting at 100% duty cycle, 802.11a/n				
Deviations:	None				
Comments:	See comments below for EUT orientation, data rate, and antenna chain				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	87-90	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
15808.260	30.1	6.9	1.2	39.0	3.0	0.0	Vert	AV	0.0	37.0	54.0	-17.0	Ch 52/56, EUT Flat, Ant A, MCS0
15780.520	30.0	6.9	1.2	298.0	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	Ch 52, EUT Flat, Ant A, 6 Mbps
15781.820	30.0	6.9	1.2	45.0	3.0	0.0	Vert	AV	0.0	36.9	54.0	-17.1	Ch 52, EUT Flat, Ant A, 6 Mbps
15811.800	30.0	6.9	1.5	46.0	3.0	0.0	Horz	AV	0.0	36.9	54.0	-17.1	Ch 52/56, EUT Flat, Ant A, MCS0
15927.630	29.9	6.8	1.2	253.0	3.0	0.0	Vert	AV	0.0	36.7	54.0	-17.3	Ch 60/64, EUT Flat, Ant A, MCS0
15927.880	29.8	6.8	1.2	297.0	3.0	0.0	Horz	AV	0.0	36.6	54.0	-17.4	Ch 60/64, EUT Flat, Ant A, MCS0
15957.500	29.7	6.8	1.2	118.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Ch 64, EUT Flat, Ant A, 6 Mbps
15958.710	29.7	6.8	1.2	129.0	3.0	0.0	Horz	AV	0.0	36.5	54.0	-17.5	Ch 64, EUT Flat, Ant A, 6 Mbps
15722.040	29.7	6.8	1.2	180.0	3.0	0.0	Vert	AV	0.0	36.5	54.0	-17.5	Ch 48, EUT Flat, Ant A, 6 Mbps
15720.370	29.7	6.8	1.2	185.0	3.0	0.0	Horz	AV	0.0	36.5	54.0	-17.5	Ch 48, EUT Flat, Ant A, 6 Mbps
15687.740	29.7	6.6	1.2	298.0	3.0	0.0	Horz	AV	0.0	36.3	54.0	-17.7	Ch 44/48, EUT Flat, Ant A, MCS0
15688.260	29.6	6.6	1.2	246.0	3.0	0.0	Vert	AV	0.0	36.2	54.0	-17.8	Ch 44/48, EUT Flat, Ant A, MCS0
15572.180	30.0	6.1	1.2	220.0	3.0	0.0	Horz	AV	0.0	36.1	54.0	-17.9	Ch 36/40, EUT Flat, Ant A, MCS0
15568.890	30.0	6.1	1.2	318.0	3.0	0.0	Vert	AV	0.0	36.1	54.0	-17.9	Ch 36/40, EUT Flat, Ant A, MCS0
15539.950	30.0	6.0	1.2	56.0	3.0	0.0	Horz	AV	0.0	36.0	54.0	-18.0	Ch 36, EUT Flat, Ant A, 6 Mbps
15537.660	30.0	6.0	1.2	30.0	3.0	0.0	Vert	AV	0.0	36.0	54.0	-18.0	Ch 36, EUT Flat, Ant A, 6 Mbps
15958.050	41.5	6.8	1.2	129.0	3.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	Ch 64, EUT Flat, Ant A, 6 Mbps
15807.680	41.2	6.9	1.5	46.0	3.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Ch 52/56, EUT Flat, Ant A, MCS0
15808.890	41.0	6.9	1.2	39.0	3.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	Ch 52/56, EUT Flat, Ant A, MCS0
15722.350	41.0	6.8	1.2	180.0	3.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	Ch 48, EUT Flat, Ant A, 6 Mbps
15929.950	40.9	6.8	1.2	297.0	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	Ch 60/64, EUT Flat, Ant A, MCS0
15780.400	40.8	6.9	1.2	45.0	3.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	Ch 52, EUT Flat, Ant A, 6 Mbps
15721.610	40.8	6.8	1.2	185.0	3.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	Ch 48, EUT Flat, Ant A, 6 Mbps
15927.880	40.7	6.8	1.2	253.0	3.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	Ch 60/64, EUT Flat, Ant A, MCS0
15692.400	40.6	6.6	1.2	246.0	3.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Ch 44/48, EUT Flat, Ant A, MCS0
15778.830	40.3	6.9	1.2	298.0	3.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Ch 52, EUT Flat, Ant A, 6 Mbps
15690.970	40.5	6.6	1.2	298.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Ch 44/48, EUT Flat, Ant A, MCS0
15570.170	41.0	6.1	1.2	220.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Ch 36/40, EUT Flat, Ant A, MCS0

Freq (MHz)	Amplitude (dBuV)	Preamp (dB)	Antenna Height (meters)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBmV/m)	Compared to Spec. (dB)	Comments
15541.180	41.1	6.0	1.2	56.0	3.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Ch 36, EUT Flat, Ant A, 6 Mbps
15960.060	39.8	6.8	1.2	118.0	3.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	Ch 64, EUT Flat, Ant A, 6 Mbps
15569.880	40.5	6.1	1.2	318.0	3.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	Ch 36/40, EUT Flat, Ant A, MCS0
15537.850	40.6	6.0	1.2	30.0	3.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	Ch 36, EUT Flat, Ant A, 6 Mbps

AC Powerline Conducted Emissions

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting 802.11(a), 100% Duty Cycle, Ch 36, 5180 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 48, 5240 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 52, 5260 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 64, 5320 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 100, 5500 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 116, 5580 MHz
Transmitting 802.11(a), 100% Duty Cycle, Ch 140, 5700 MHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MCSO1665 - 4

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
High Pass Filter	TTE	H97-100K-50-720B	HHF	2/1/2012	24 mo
LISN	Solar	9252-50-R-24-BNC	LIM	1/16/2013	12 mo
NC01 Cables	N/A	Conducted / NF Probe Cable	NC4	12/14/2012	12 mo
Receiver	Rohde & Schwarz	ESCI	ARE	5/30/2013	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.			

TEST DESCRIPTION

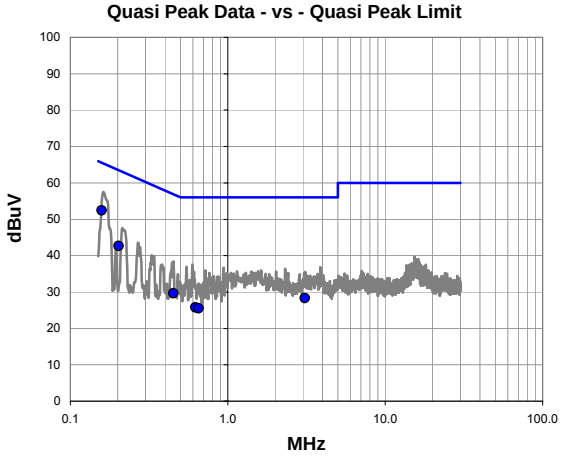
Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at 6 Mbps at with a channel output power of 12 dBm. The test setup and procedures were in accordance with ANSI C63.10-2009.

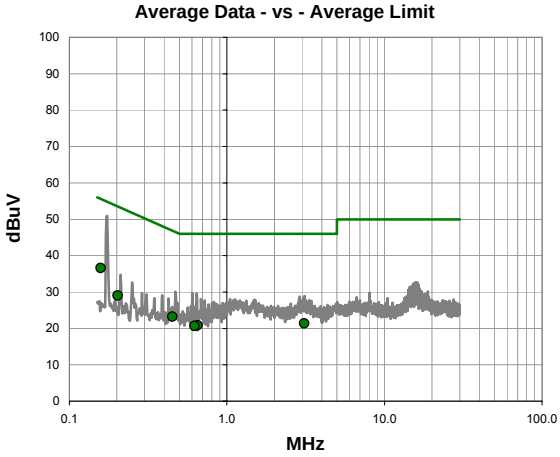
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 36, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	148	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.158	32.1	20.3	52.4	65.6	-13.2
0.203	22.3	20.3	42.6	63.5	-20.8
0.451	9.4	20.3	29.7	56.9	-27.2
3.096	7.9	20.4	28.3	56.0	-27.7
0.624	5.5	20.2	25.7	56.0	-30.3
0.653	5.3	20.2	25.5	56.0	-30.5

Average Data - vs - Average Limit

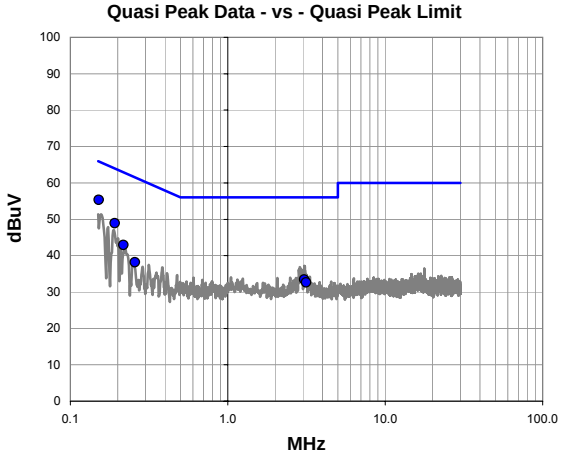
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.158	16.3	20.3	36.6	55.6	-19.0
0.451	3.0	20.3	23.3	46.9	-23.6
0.203	8.7	20.3	29.0	53.5	-24.4
3.096	1.0	20.4	21.4	46.0	-24.6
0.653	0.6	20.2	20.8	46.0	-25.2
0.624	0.4	20.2	20.6	46.0	-25.4

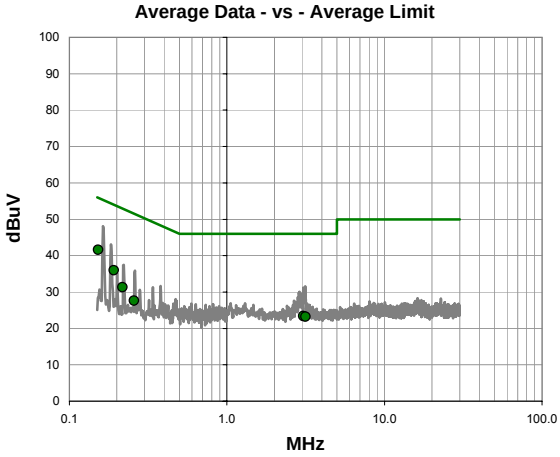
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 36, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	149	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.152	35.0	20.3	55.3	65.9	-10.6
0.192	28.5	20.4	48.9	63.9	-15.1
0.217	22.6	20.3	42.9	62.9	-20.0
3.056	13.0	20.4	33.4	56.0	-22.6
0.257	18.0	20.2	38.2	61.5	-23.3
3.148	12.2	20.4	32.6	56.0	-23.4

Average Data - vs - Average Limit

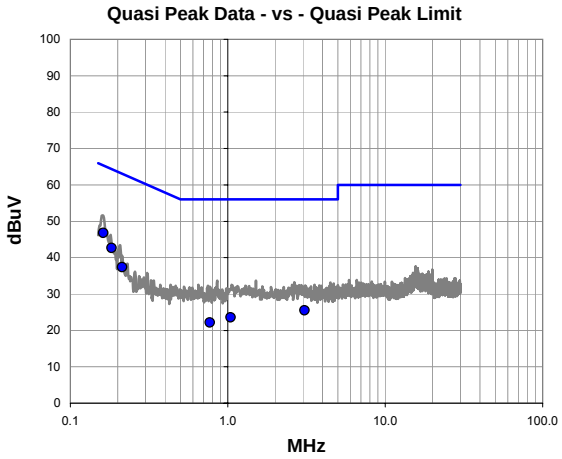
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.152	21.3	20.3	41.6	55.9	-14.3
0.192	15.6	20.4	36.0	53.9	-18.0
0.217	11.0	20.3	31.3	52.9	-21.6
3.056	3.0	20.4	23.4	46.0	-22.6
3.148	2.8	20.4	23.2	46.0	-22.8
0.257	7.4	20.2	27.6	51.5	-23.9

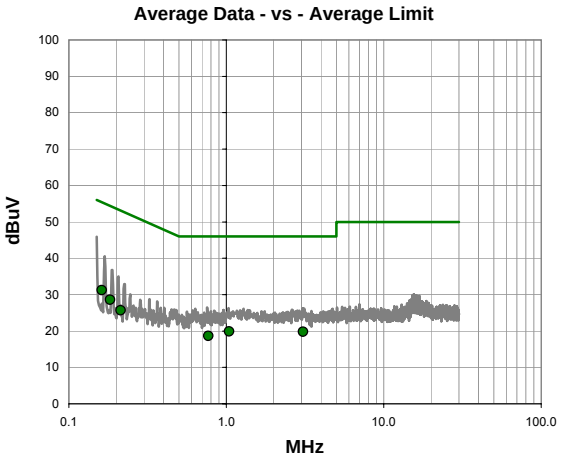
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 48, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	150	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	26.5	20.3	46.8	65.4	-18.5
0.183	22.3	20.4	42.7	64.3	-21.7
0.213	17.1	20.3	37.4	63.1	-25.7
3.076	5.1	20.4	25.5	56.0	-30.5
1.044	3.3	20.3	23.6	56.0	-32.4
0.769	1.9	20.3	22.2	56.0	-33.9

Average Data - vs - Average Limit

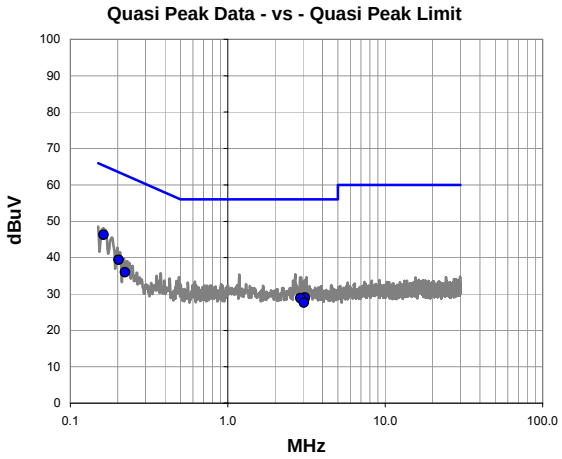
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	10.9	20.3	31.2	55.4	-24.1
0.183	8.2	20.4	28.6	54.3	-25.8
1.044	-0.4	20.3	19.9	46.0	-26.1
3.076	-0.6	20.4	19.8	46.0	-26.2
0.769	-1.6	20.3	18.7	46.0	-27.4
0.213	5.4	20.3	25.7	53.1	-27.4

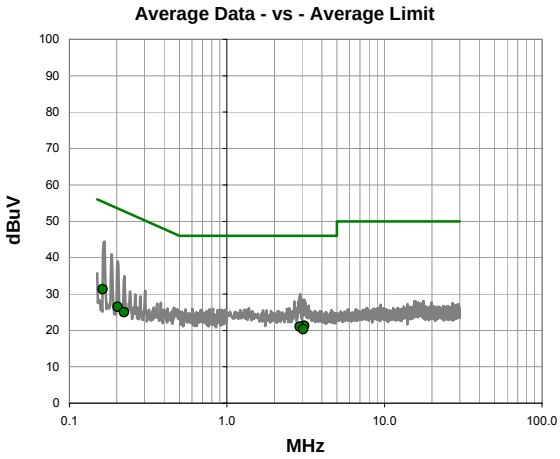
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 48, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	151	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.163	25.9	20.3	46.2	65.3	-19.1
0.203	19.1	20.3	39.4	63.5	-24.0
0.223	15.7	20.3	36.0	62.7	-26.7
3.092	8.6	20.4	29.0	56.0	-27.0
2.900	8.5	20.4	28.9	56.0	-27.1
3.052	7.2	20.4	27.6	56.0	-28.4

Average Data - vs - Average Limit

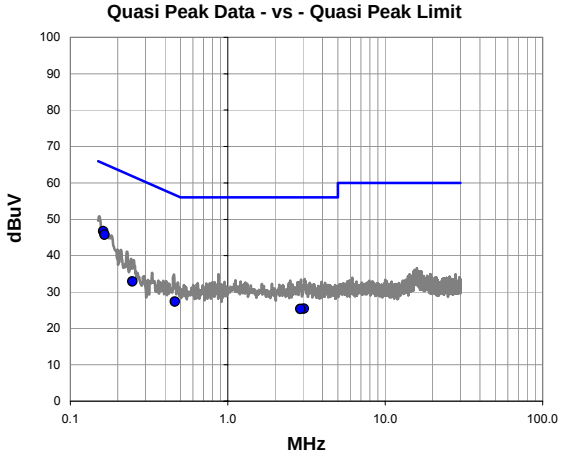
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.163	11.0	20.3	31.3	55.3	-24.0
3.092	0.9	20.4	21.3	46.0	-24.7
2.900	0.6	20.4	21.0	46.0	-25.0
3.052	-0.1	20.4	20.3	46.0	-25.7
0.203	6.1	20.3	26.4	53.5	-27.0
0.223	4.7	20.3	25.0	52.7	-27.7

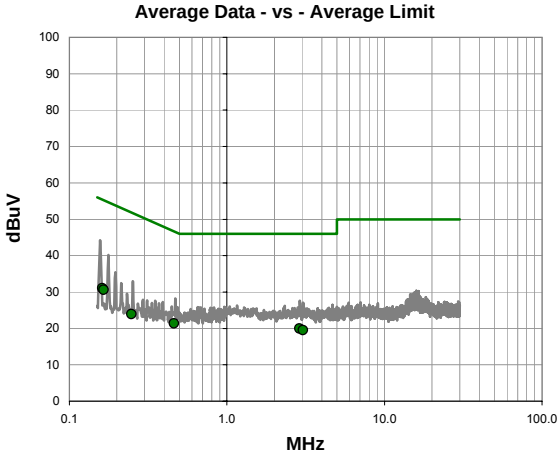
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 52, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	152	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	26.4	20.3	46.7	65.4	-18.6
0.165	25.4	20.3	45.7	65.2	-19.5
0.248	12.7	20.2	32.9	61.8	-28.9
0.462	7.1	20.2	27.3	56.7	-29.3
3.044	5.0	20.4	25.4	56.0	-30.6
2.892	4.9	20.4	25.3	56.0	-30.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	10.7	20.3	31.0	55.4	-24.3
0.165	10.3	20.3	30.6	55.2	-24.6
0.462	1.1	20.2	21.3	46.7	-25.3
2.892	-0.4	20.4	20.0	46.0	-26.0
3.044	-0.9	20.4	19.5	46.0	-26.5
0.248	3.7	20.2	23.9	51.8	-27.9

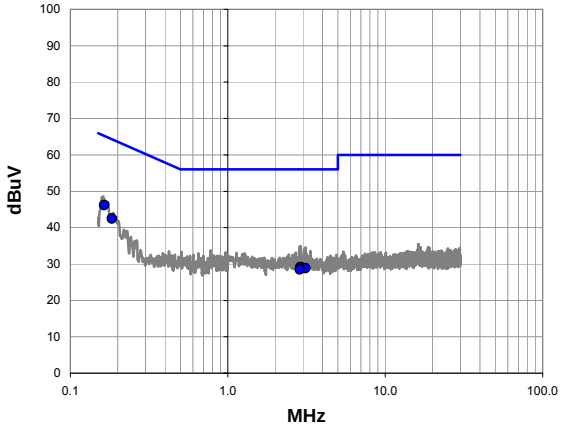
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 52, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

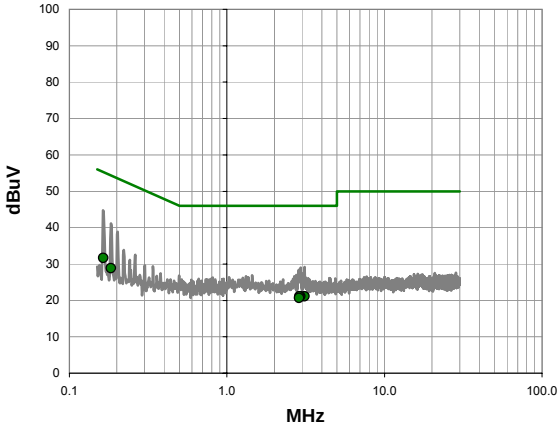
Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	153	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	25.8	20.3	46.1	65.3	-19.1
0.184	22.1	20.4	42.5	64.3	-21.8
2.924	8.7	20.4	29.1	56.0	-26.9
2.892	8.7	20.4	29.1	56.0	-26.9
3.116	8.4	20.4	28.8	56.0	-27.2
2.868	8.1	20.4	28.5	56.0	-27.5

Average Data - vs - Average Limit

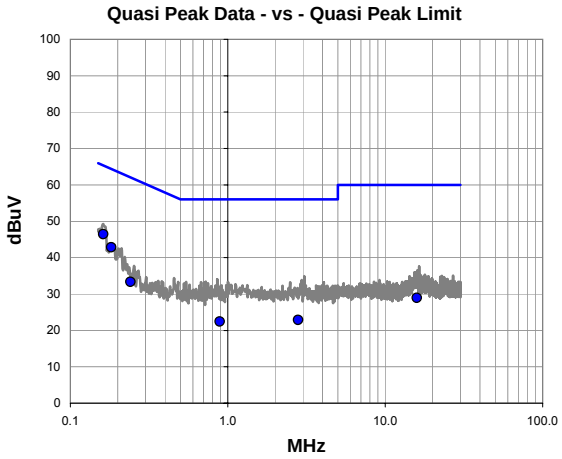
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	11.3	20.3	31.6	55.3	-23.6
3.116	0.7	20.4	21.1	46.0	-24.9
2.924	0.7	20.4	21.1	46.0	-24.9
2.892	0.7	20.4	21.1	46.0	-24.9
2.868	0.3	20.4	20.7	46.0	-25.3
0.184	8.5	20.4	28.9	54.3	-25.4

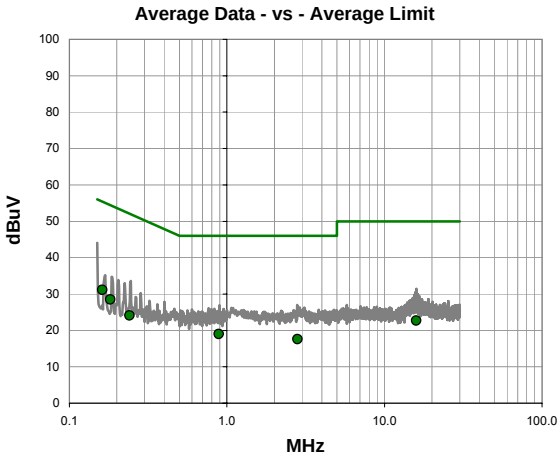
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 64, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	154	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	26.1	20.3	46.4	65.4	-18.9
0.182	22.5	20.4	42.9	64.4	-21.5
0.241	13.1	20.2	33.3	62.1	-28.7
15.928	7.8	21.1	28.9	60.0	-31.1
2.804	2.5	20.4	22.9	56.0	-33.1
0.888	2.2	20.3	22.5	56.0	-33.5

Average Data - vs - Average Limit

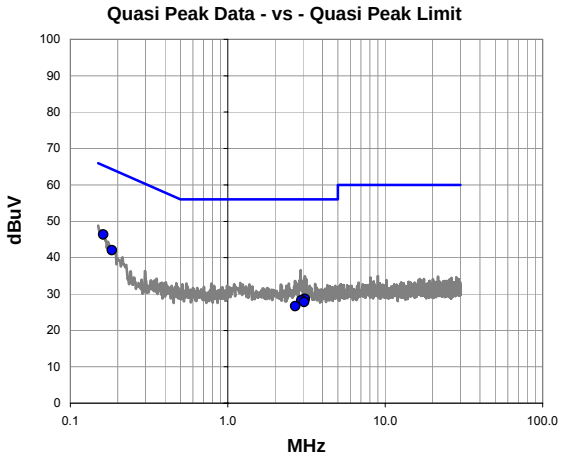
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	10.8	20.3	31.1	55.4	-24.2
0.182	8.1	20.4	28.5	54.4	-25.9
0.888	-1.3	20.3	19.0	46.0	-27.0
15.928	1.6	21.1	22.7	50.0	-27.3
0.241	3.9	20.2	24.1	52.1	-27.9
2.804	-2.8	20.4	17.6	46.0	-28.4

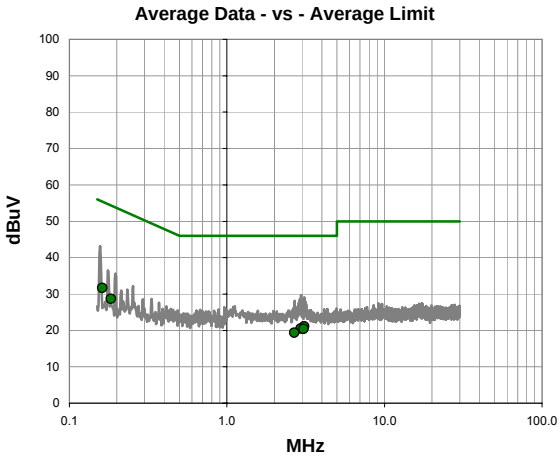
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 64, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	155	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	26.0	20.3	46.3	65.4	-19.0
0.184	21.7	20.4	42.1	64.3	-22.2
3.096	8.3	20.4	28.7	56.0	-27.3
2.940	7.8	20.4	28.2	56.0	-27.8
3.064	7.4	20.4	27.8	56.0	-28.2
2.684	6.3	20.4	26.7	56.0	-29.3

Average Data - vs - Average Limit

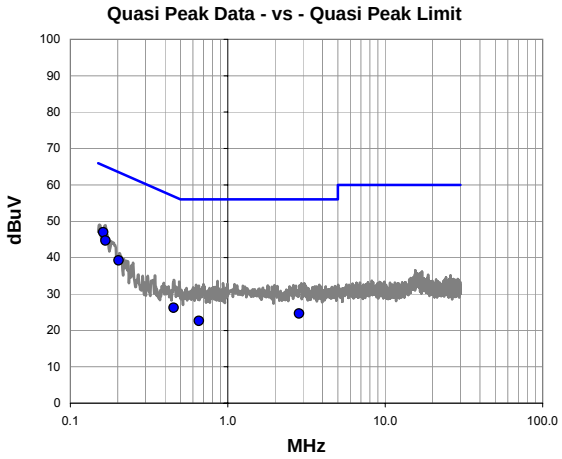
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	11.3	20.3	31.6	55.4	-23.7
3.096	0.7	20.4	21.1	46.0	-24.9
2.940	0.1	20.4	20.5	46.0	-25.5
3.064	0.0	20.4	20.4	46.0	-25.6
0.184	8.3	20.4	28.7	54.3	-25.6
2.684	-1.0	20.4	19.4	46.0	-26.6

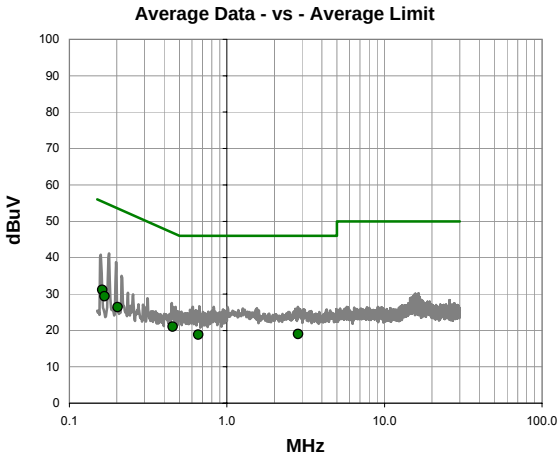
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 100, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	156	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	26.6	20.3	46.9	65.4	-18.4
0.167	24.3	20.3	44.6	65.1	-20.5
0.203	18.9	20.3	39.2	63.5	-24.2
0.454	6.0	20.3	26.3	56.8	-30.5
2.836	4.2	20.4	24.6	56.0	-31.4
0.657	2.4	20.2	22.6	56.0	-33.4

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.162	10.8	20.3	31.1	55.4	-24.2
0.454	0.8	20.3	21.1	46.8	-25.7
0.167	9.0	20.3	29.3	55.1	-25.8
2.836	-1.4	20.4	19.0	46.0	-27.0
0.203	6.0	20.3	26.3	53.5	-27.1
0.657	-1.4	20.2	18.8	46.0	-27.2

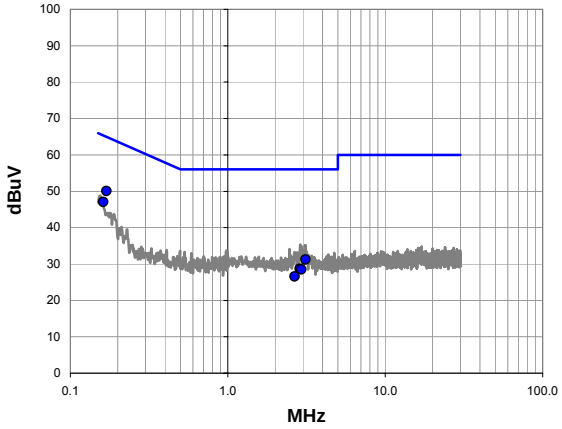
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 100, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

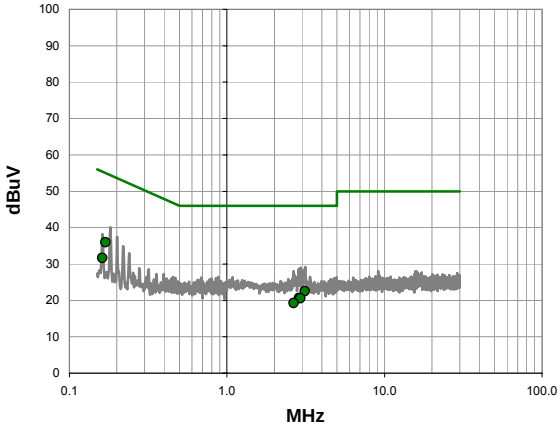
Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	157	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.170	29.7	20.4	50.1	65.0	-14.9
0.162	26.7	20.3	47.0	65.4	-18.3
3.124	10.8	20.4	31.2	56.0	-24.8
2.868	8.3	20.4	28.7	56.0	-27.3
2.932	8.1	20.4	28.5	56.0	-27.5
2.656	6.2	20.4	26.6	56.0	-29.4

Average Data - vs - Average Limit

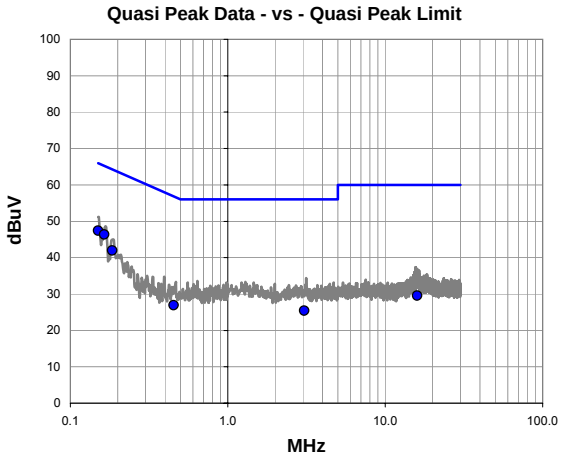
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.170	15.6	20.4	36.0	55.0	-19.0
3.124	2.1	20.4	22.5	46.0	-23.5
0.162	11.3	20.3	31.6	55.4	-23.7
2.868	0.3	20.4	20.7	46.0	-25.3
2.932	0.2	20.4	20.6	46.0	-25.4
2.656	-1.1	20.4	19.3	46.0	-26.7

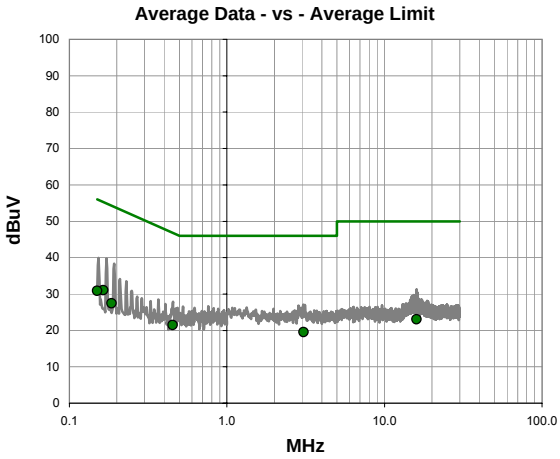
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 116, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	158	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	27.1	20.3	47.4	66.0	-18.6
0.164	26.0	20.3	46.3	65.3	-18.9
0.185	21.6	20.4	42.0	64.3	-22.3
0.454	6.7	20.3	27.0	56.8	-29.8
16.004	8.4	21.1	29.5	60.0	-30.5
3.064	5.0	20.4	25.4	56.0	-30.6

Average Data - vs - Average Limit

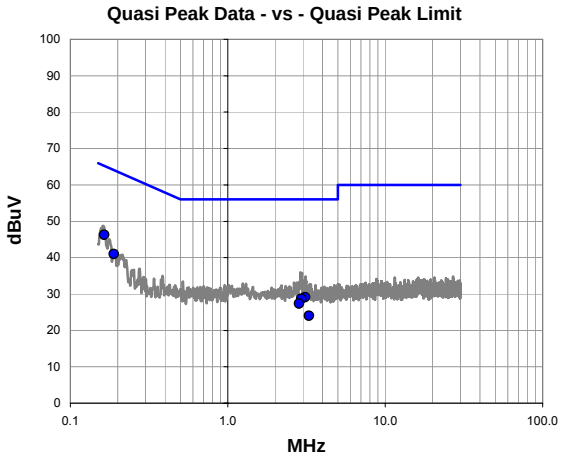
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	10.7	20.3	31.0	55.3	-24.2
0.150	10.6	20.3	30.9	56.0	-25.1
0.454	1.2	20.3	21.5	46.8	-25.3
3.064	-0.9	20.4	19.5	46.0	-26.5
0.185	7.1	20.4	27.5	54.3	-26.8
16.004	1.9	21.1	23.0	50.0	-27.0

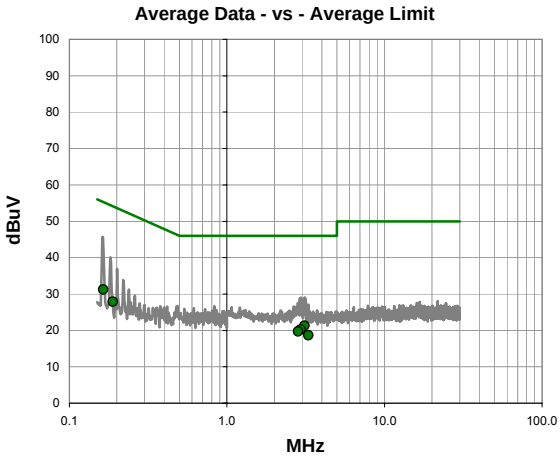
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 116, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	159	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	25.9	20.3	46.2	65.3	-19.0
0.189	20.6	20.4	41.0	64.1	-23.1
3.104	8.7	20.4	29.1	56.0	-26.9
2.940	8.3	20.4	28.7	56.0	-27.3
2.836	7.0	20.4	27.4	56.0	-28.6
3.288	3.6	20.4	24.0	56.0	-32.0

Average Data - vs - Average Limit

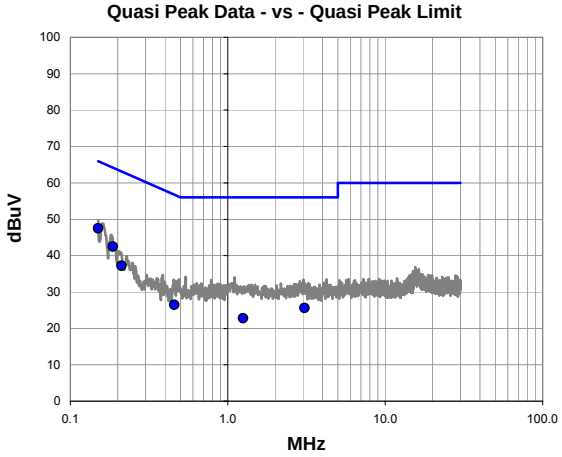
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.164	10.9	20.3	31.2	55.3	-24.0
3.104	0.9	20.4	21.3	46.0	-24.7
2.940	-0.2	20.4	20.2	46.0	-25.8
0.189	7.5	20.4	27.9	54.1	-26.2
2.836	-0.7	20.4	19.7	46.0	-26.3
3.288	-1.8	20.4	18.6	46.0	-27.4

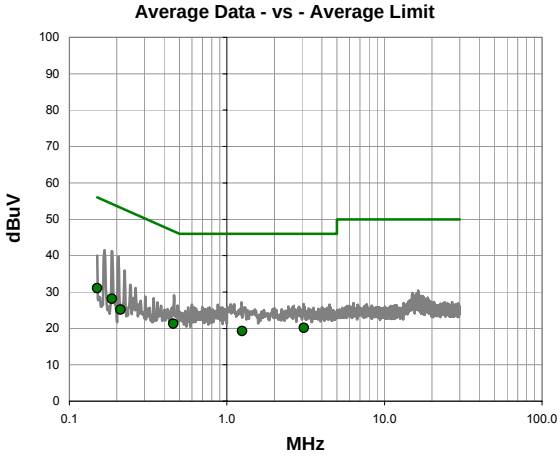
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 140, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	Test Method
FCC 15.407:2013	ANSI C63.10:2009

Run #	160	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	27.2	20.3	47.5	66.0	-18.5
0.186	22.1	20.4	42.5	64.2	-21.7
0.211	16.9	20.3	37.2	63.2	-25.9
0.457	6.2	20.3	26.5	56.7	-30.3
3.076	5.2	20.4	25.6	56.0	-30.4
1.252	2.5	20.3	22.8	56.0	-33.2

Average Data - vs - Average Limit

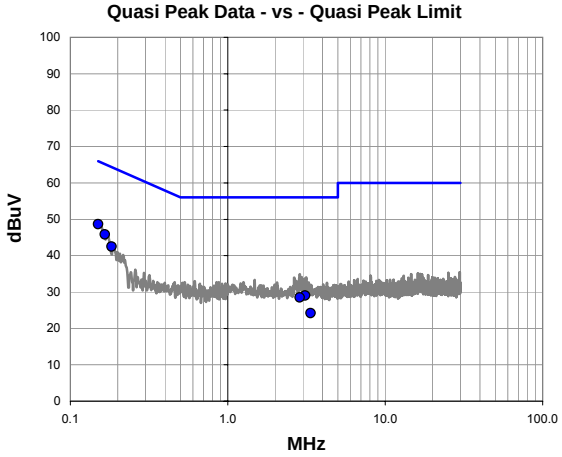
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	10.8	20.3	31.1	56.0	-24.9
0.457	1.0	20.3	21.3	46.7	-25.5
3.076	-0.3	20.4	20.1	46.0	-25.9
0.186	7.8	20.4	28.2	54.2	-26.0
1.252	-1.0	20.3	19.3	46.0	-26.7
0.211	4.8	20.3	25.1	53.2	-28.0

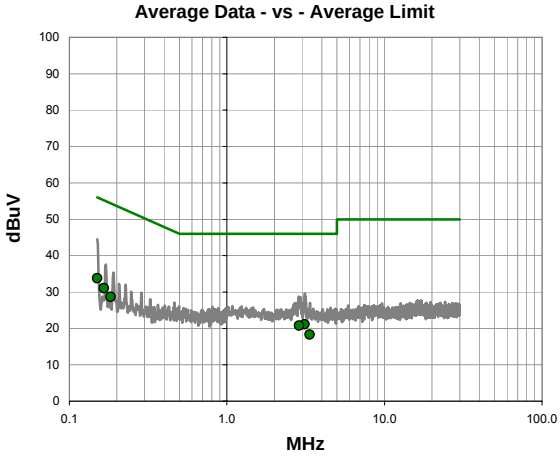
AC Powerline Conducted Emissions

Work Order:	MCSO1665	**Date:**	07/25/13		
Project:	None	**Temperature:**	24 °C		
Job Site:	NC05	**Humidity:**	44% RH		
Serial Number:	6079632553	**Barometric Pres.:**	1019 mbar	**Tested by:**	Richard Mellroth
EUT:	1601				
Configuration:	4				
Customer:	Microsoft Corporation				
Attendees:	None				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting 802.11(a), Ch 140, 6 Mbps				
Deviations:	None				
Comments:	EUT is operating at 100% duty cycle				

Test Specifications	**Test Method**
FCC 15.407:2013	ANSI C63.10:2009

Run #	161	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass





Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	28.4	20.3	48.7	66.0	-17.3
0.166	25.5	20.3	45.8	65.2	-19.3
0.183	22.1	20.4	42.5	64.3	-21.9
3.108	8.6	20.4	29.0	56.0	-27.0
2.868	8.1	20.4	28.5	56.0	-27.5
3.360	3.8	20.4	24.2	56.0	-31.8

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.150	13.5	20.3	33.8	56.0	-22.2
0.166	10.7	20.3	31.0	55.2	-24.1
3.108	0.7	20.4	21.1	46.0	-24.9
2.868	0.4	20.4	20.8	46.0	-25.2
0.183	8.3	20.4	28.7	54.3	-25.7
3.360	-2.1	20.4	18.3	46.0	-27.7

Frequency Stability - Antenna A

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	NCR	0
Humidity Temperature Meter	Omegaette	HH311	DTY	3/29/2011	36
Multimeter	Tektronix	DMM912	MMH	2/5/2013	24
Signal Generator	Agilent	E8257D	TGX	3/26/2012	36
Power Meter	Gigatronics	8651A	SPM	1/9/2012	24
Power Sensor	Gigatronics	80701A	SPL	7/8/2011	36
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	3/5/2013	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2012	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2012	24

TEST DESCRIPTION

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Per the requirements of FCC 15.407:

"Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual."

No specific limits are provided in either FCC 15.407, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 100ppm will still allow the radio to be operating within the band.

Frequency Stability - Antenna A

EUT:	1601	Work Order:	MCSO1665
Serial Number:	017980332453	Date:	07/19/13
Customer:	Microsoft Corporation	Temperature:	24.5°C
Attendees:	None	Humidity:	46%
Project:	None	Barometric Pres.:	1018
Tested by:	Brandon Hobbs	Job Site:	EV09
Power:	12 VDC		

TEST SPECIFICATIONS	Test Method
FCC 15.407:2013	ANSI C63.10:2009

COMMENTS

The EUT was operating at 100% duty cycle. The EUT went into extreme temperature shutdown mode at +50°C and -30°C. As a result the device powered off and was not tranmitting. The values while in the shutdown mode were recorded as 0ppm.

DEVIATIONS FROM TEST STANDARD

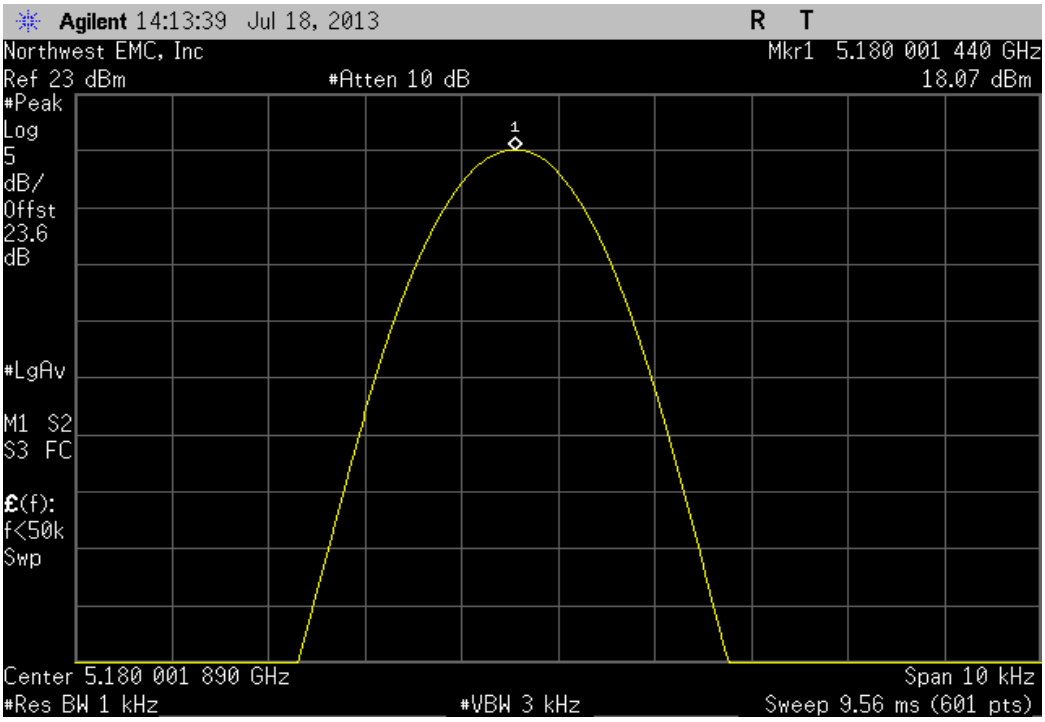
None

Configuration #	3	Signature

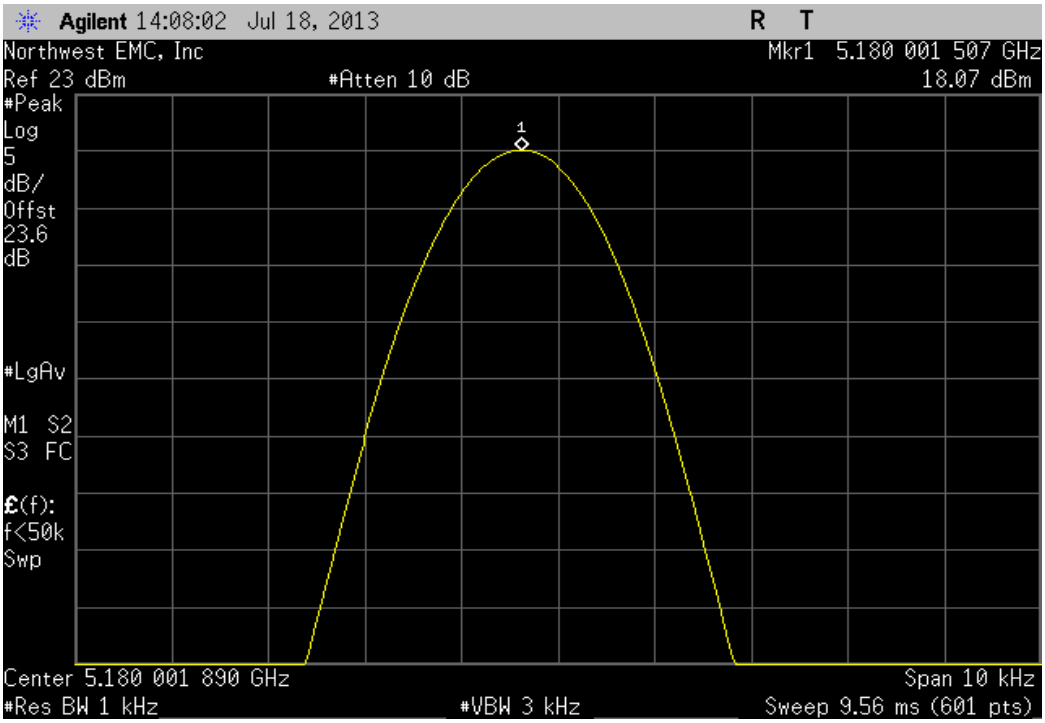
	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
5150 MHz - 5250 MHz - Low Channel, 5180 MHz					
Voltage: 115%	5180.00144	5180	0.3	100	Pass
Voltage: 100%	5180.001507	5180	0.3	100	Pass
Voltage: 85%	5180.001357	5180	0.3	100	Pass
Temperature: +50°	5180	5180	0	100	Pass
Temperature: +40°	5180.000988	5180	0.2	100	Pass
Temperature: +30°	5180.001323	5180	0.3	100	Pass
Temperature: +20°	5180.001173	5180	0.2	100	Pass
Temperature: +10°	5180.000453	5180	0.1	100	Pass
Temperature: 0°	5179.99972	5180	0	100	Pass
Temperature: -10°	5180.000187	5180	0	100	Pass
Temperature: -20°	5180.000487	5180	0.1	100	Pass
Temperature: -30°	5180	5180	0	100	Pass
5250 MHz - 5350 MHz - High Channel, 5320 MHz					
Voltage: 115%	5320.001407	5320	0.3	100	Pass
Voltage: 100%	5320.001441	5320	0.3	100	Pass
Voltage: 85%	5320.00134	5320	0.2	100	Pass
Temperature: +50°	5320	5320	0	100	Pass
Temperature: +40°	5320.00099	5320	0.2	100	Pass
Temperature: +30°	5320.00134	5320	0.2	100	Pass
Temperature: +20°	5320.001123	5320	0.2	100	Pass
Temperature: +10°	5320.000607	5320	0.1	100	Pass
Temperature: 0°	5319.999636	5320	0.1	100	Pass
Temperature: -10°	5320.000206	5320	0	100	Pass
Temperature: -20°	5320.000556	5320	0.1	100	Pass
Temperature: -30°	5320	5320	0	100	Pass
5470 MHz - 5725 MHz - Low Channel, 5500 MHz					
Voltage: 115%	5500.001552	5500	0.3	100	Pass
Voltage: 100%	5500.001603	5500	0.3	100	Pass
Voltage: 85%	5500.001486	5500	0.3	100	Pass
Temperature: +50°	5500	5500	0	100	Pass
Temperature: +40°	5500.001018	5500	0.2	100	Pass
Temperature: +30°	5500.001436	5500	0.3	100	Pass
Temperature: +20°	5500.001119	5500	0.2	100	Pass
Temperature: +10°	5500.000685	5500	0.1	100	Pass
Temperature: 0°	5499.9996	5500	0.1	100	Pass
Temperature: -10°	5500.000234	5500	0	100	Pass
Temperature: -20°	5500.000585	5500	0.1	100	Pass
Temperature: -30°	5500	5500	0	100	Pass
5470 MHz - 5725 MHz - High Channel, 5700 MHz					
Voltage: 115%	5700.001605	5700	0.3	100	Pass
Voltage: 100%	5700.001655	5700	0.3	100	Pass
Voltage: 85%	5700.001555	5700	0.3	100	Pass
Temperature: +50°	5700	5700	0	100	Pass
Temperature: +40°	5700.001038	5700	0.2	100	Pass
Temperature: +30°	5700.001472	5700	0.3	100	Pass
Temperature: +20°	5700.001288	5700	0.2	100	Pass
Temperature: +10°	5700.000921	5700	0.2	100	Pass
Temperature: 0°	5699.999736	5700	0	100	Pass
Temperature: -10°	5700.000304	5700	0	100	Pass
Temperature: -20°	5700.000603	5700	0.1	100	Pass
Temperature: -30°	5700	5700	0	100	Pass

Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.00144	5180	0.3	100	Pass

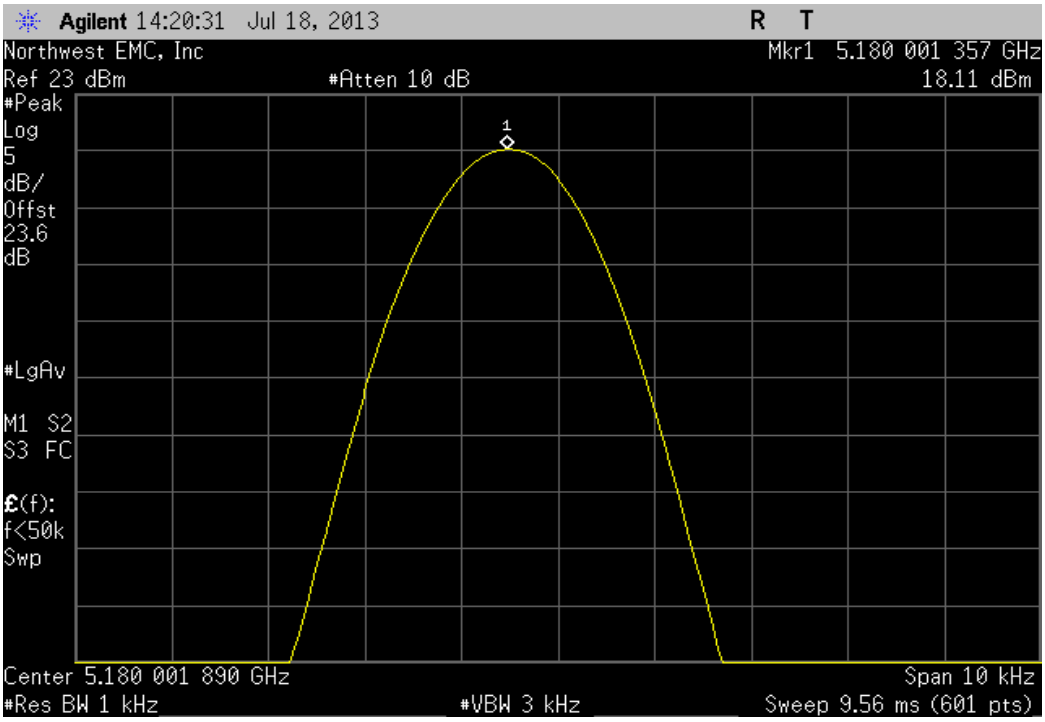


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.001507	5180	0.3	100	Pass

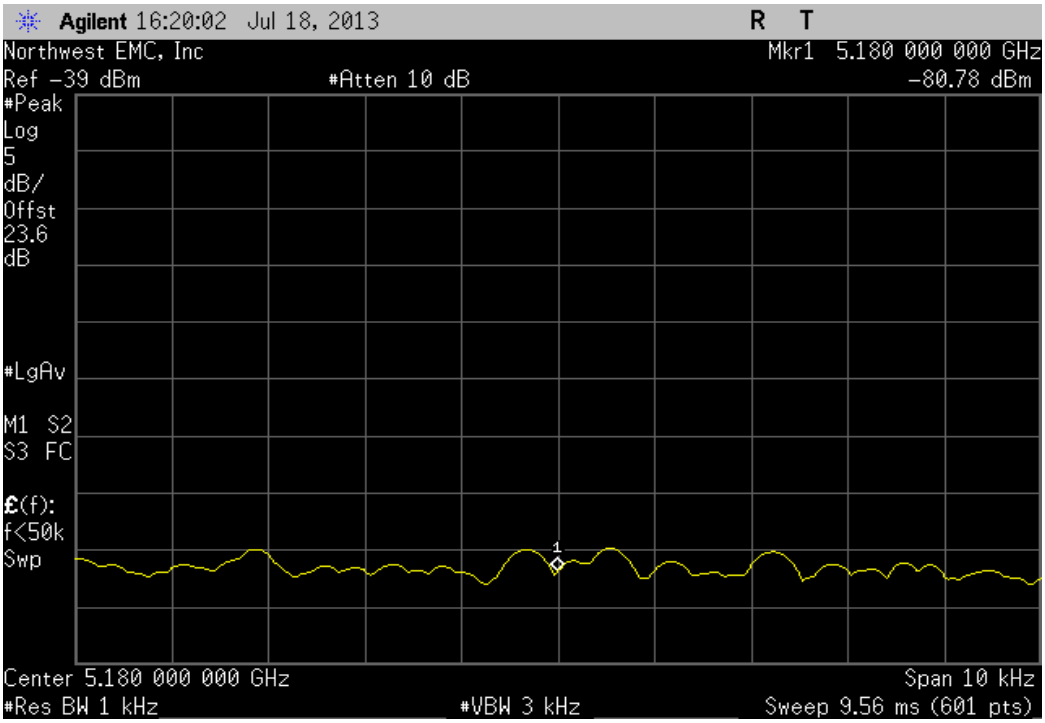


Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.001357	5180	0.3	100	Pass

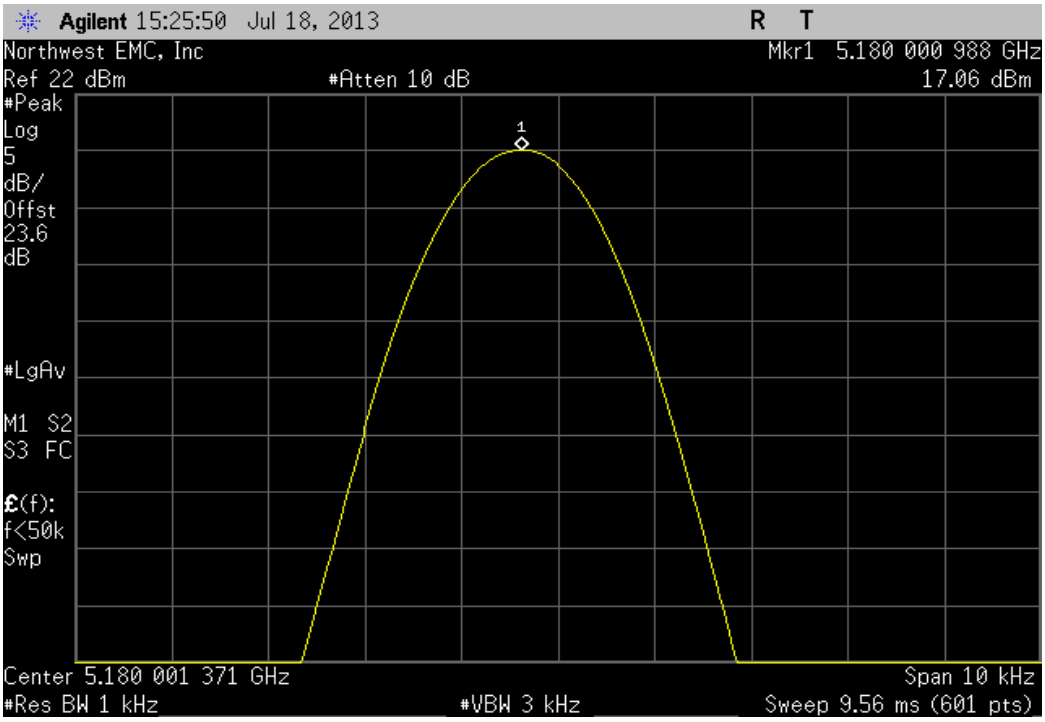


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180	5180	0	100	Pass

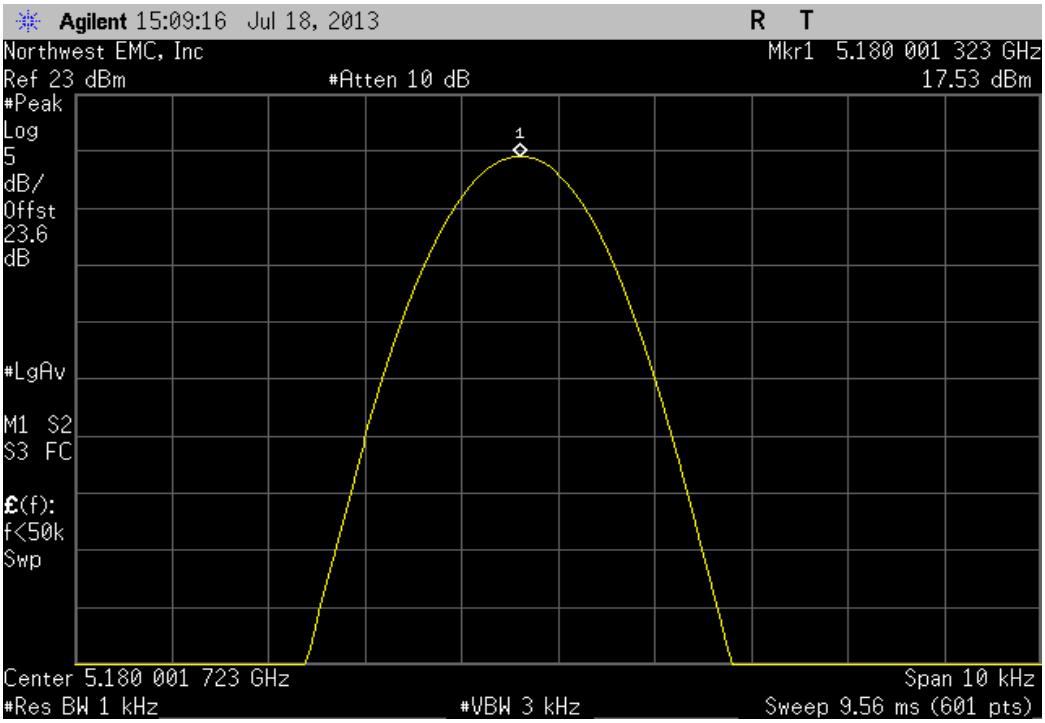


Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000988	5180	0.2	100	Pass

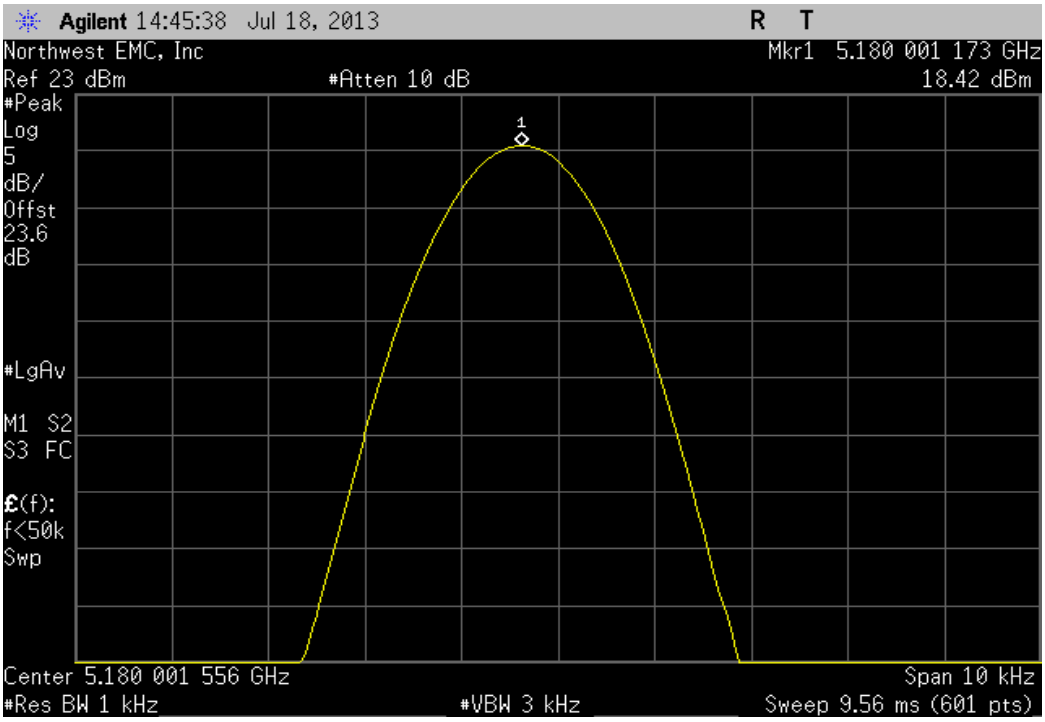


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.001323	5180	0.3	100	Pass

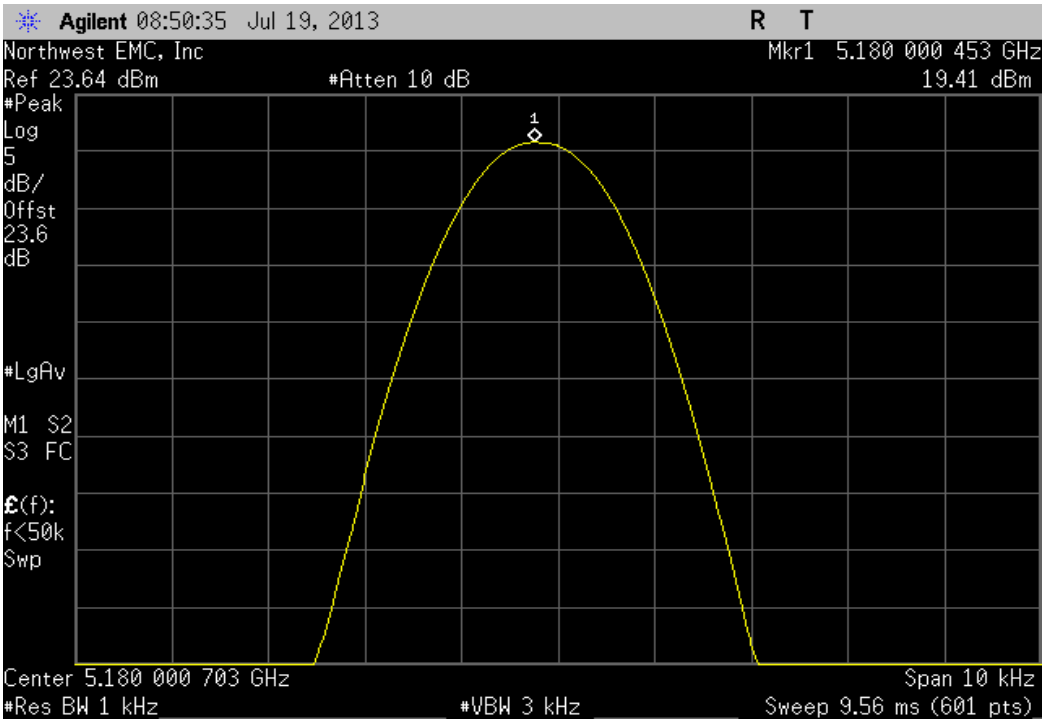


Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.001173	5180	0.2	100	Pass

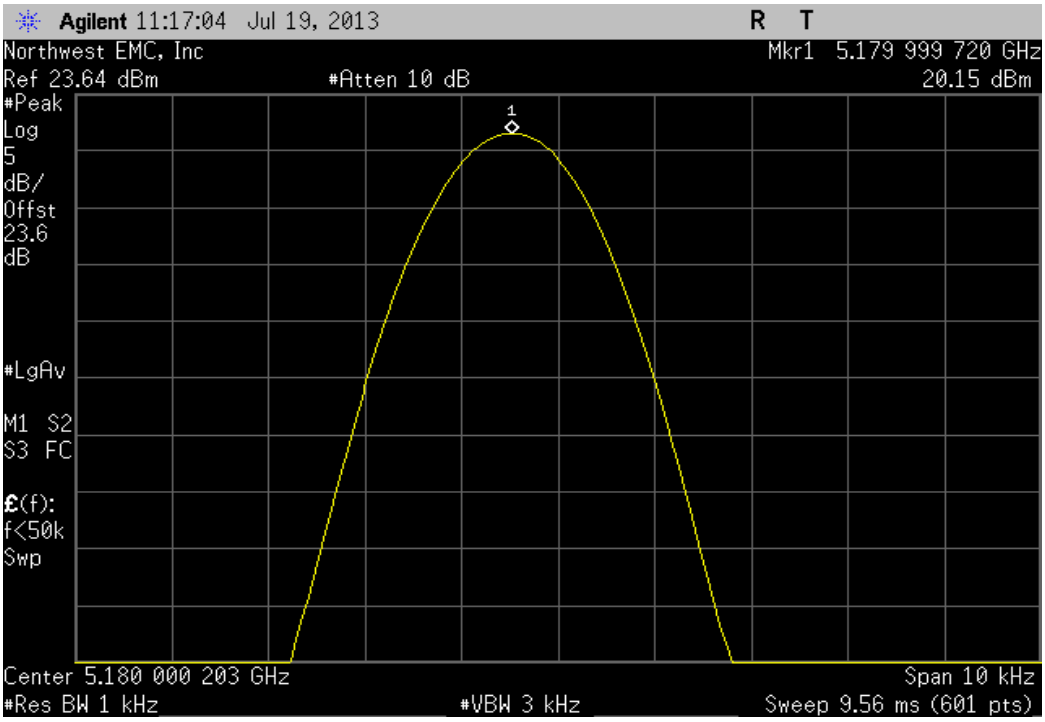


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000453	5180	0.1	100	Pass

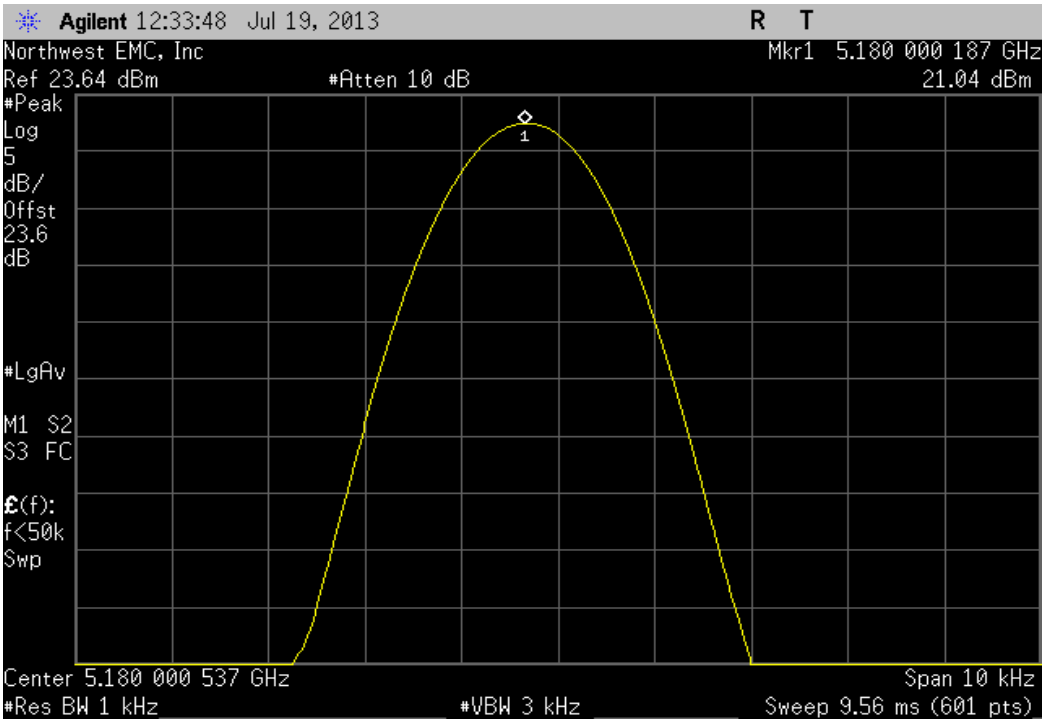


Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5179.99972	5180	0	100	Pass

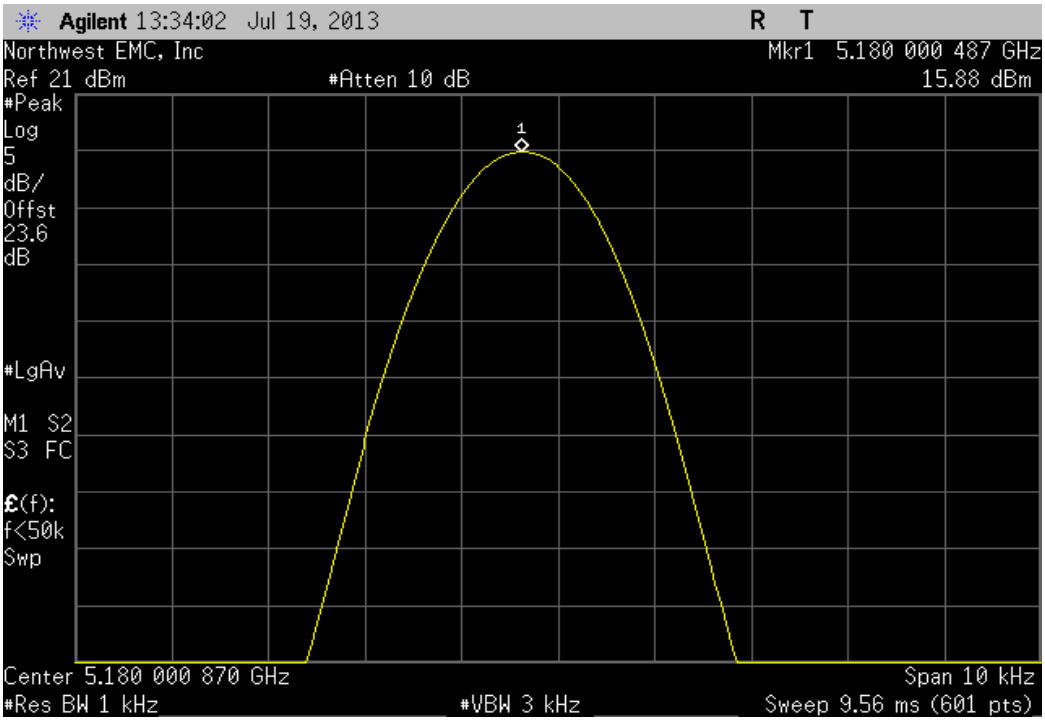


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000187	5180	0	100	Pass

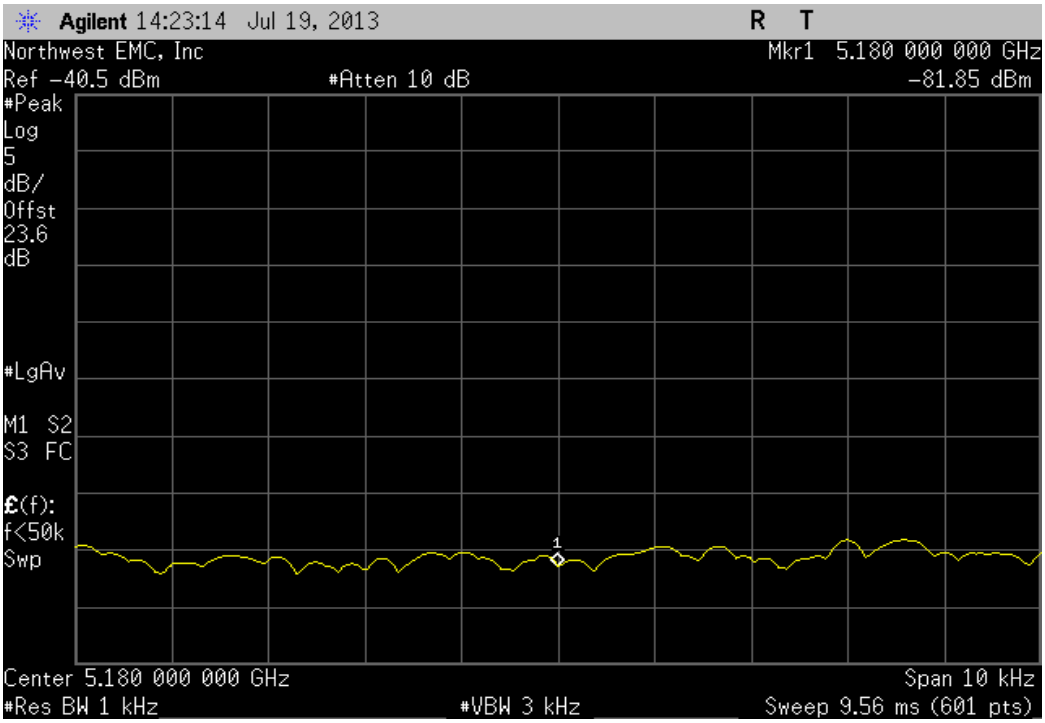


Frequency Stability - Antenna A

5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180.000487	5180	0.1	100	Pass

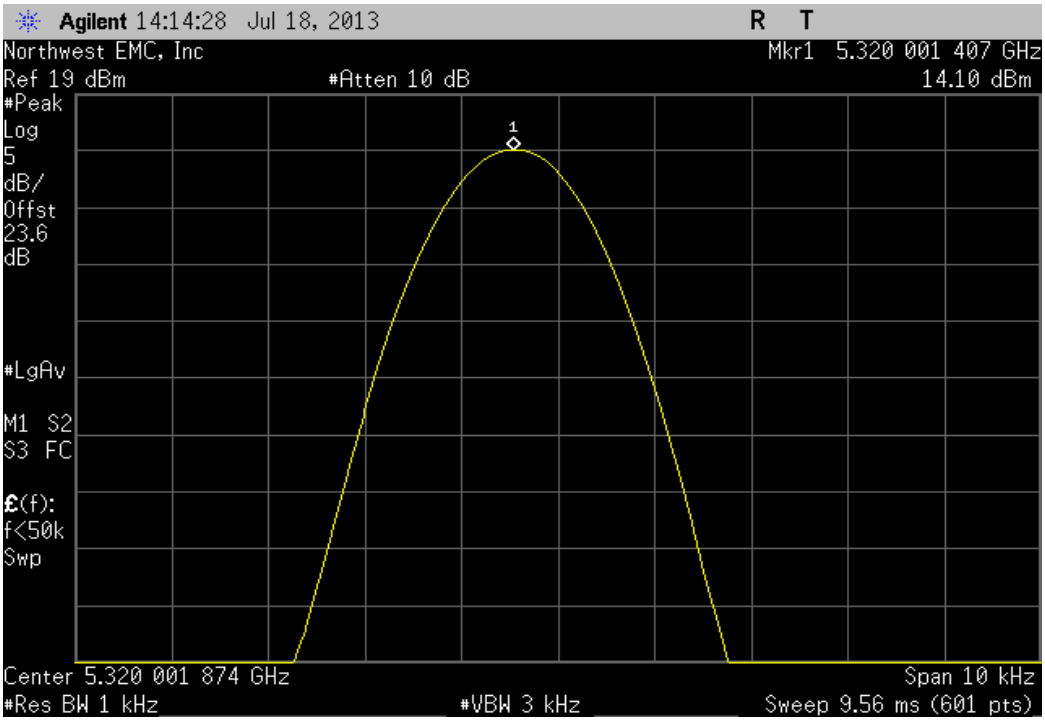


5150 MHz - 5250 MHz - Low Channel, 5180 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5180	5180	0	100	Pass

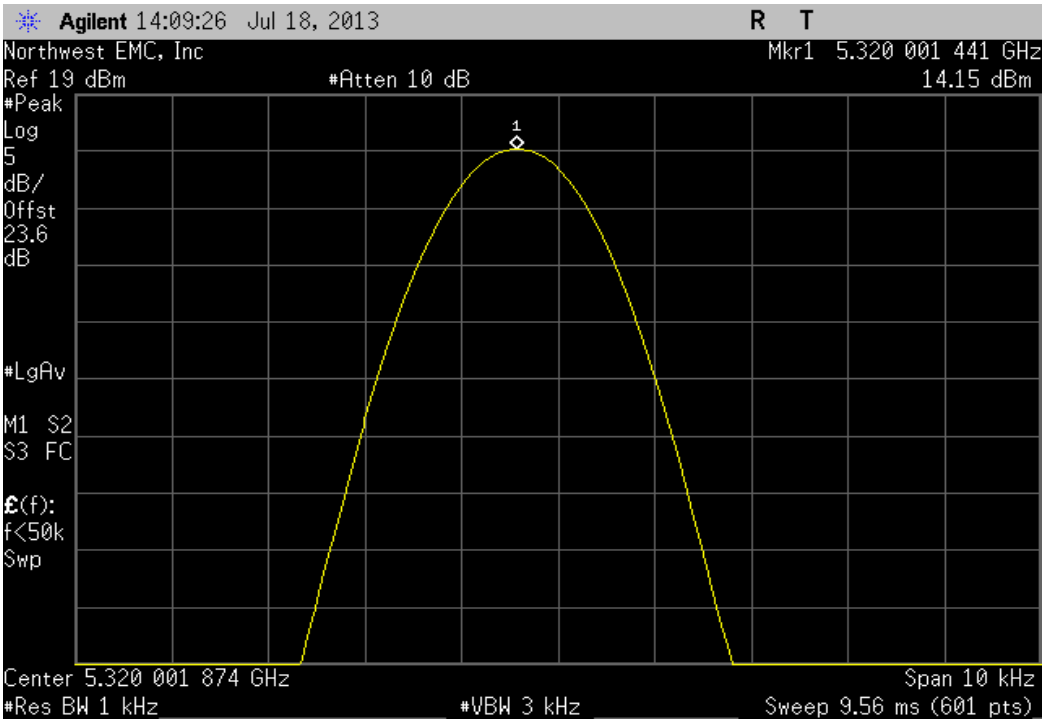


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.001407	5320	0.3	100	Pass

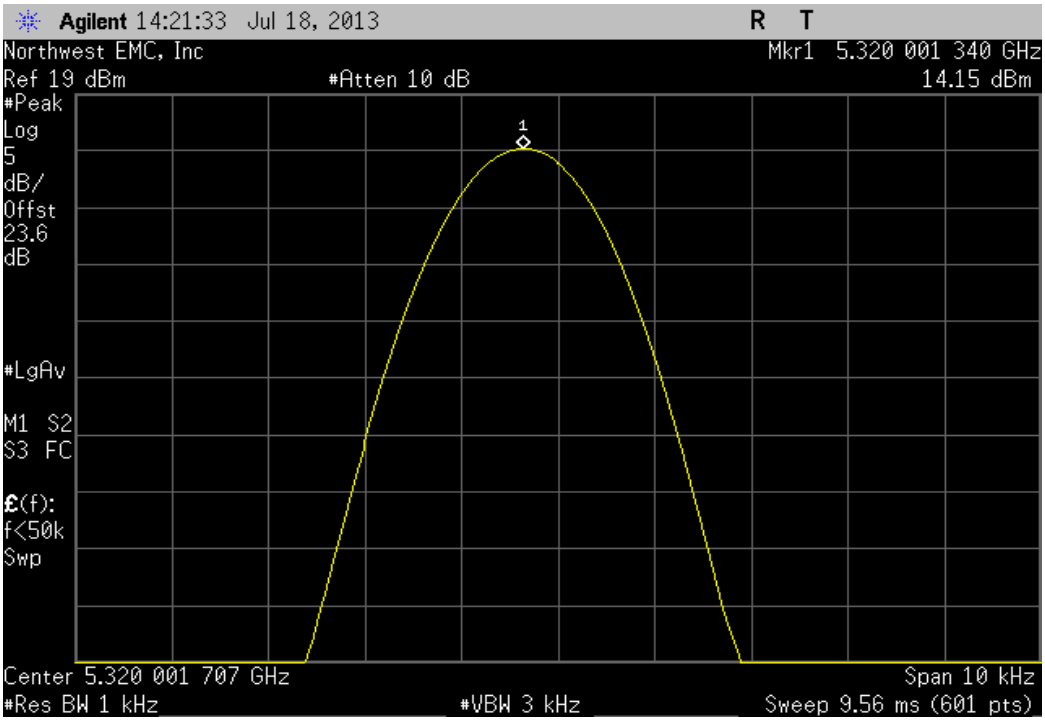


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.001441	5320	0.3	100	Pass

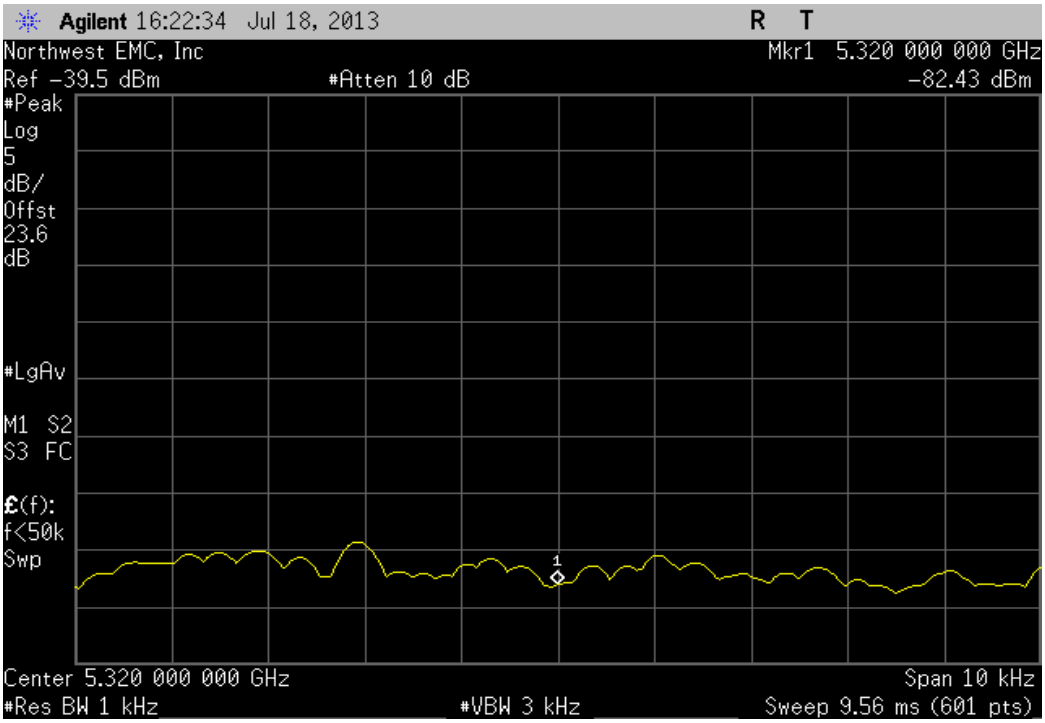


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.00134	5320	0.2	100	Pass

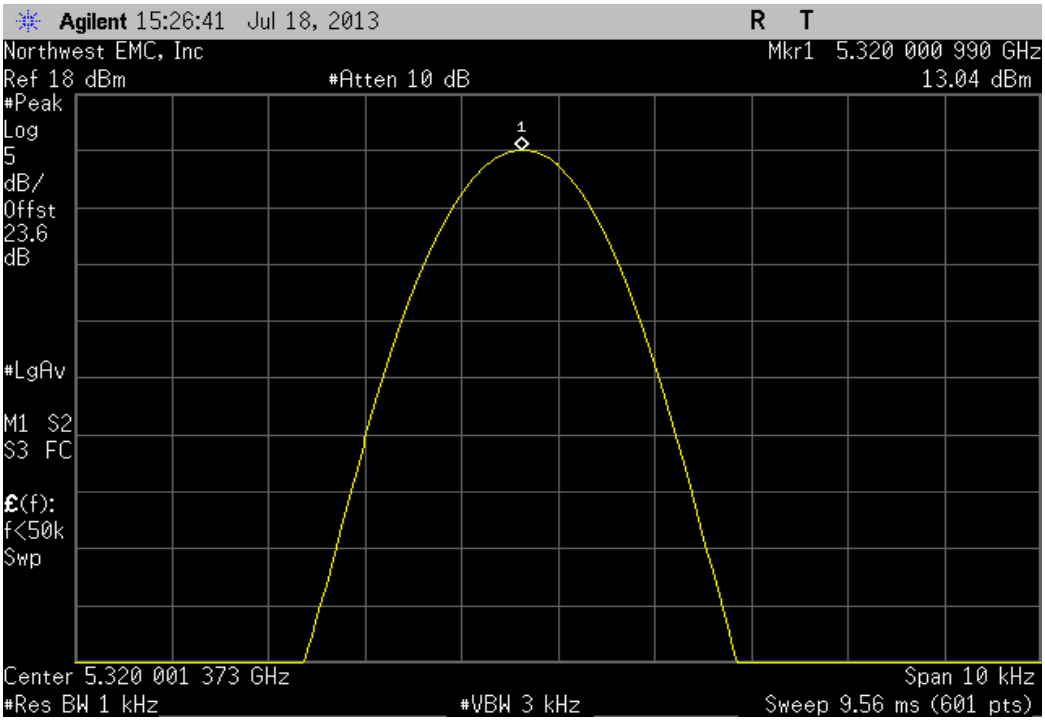


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320	5320	0	100	Pass

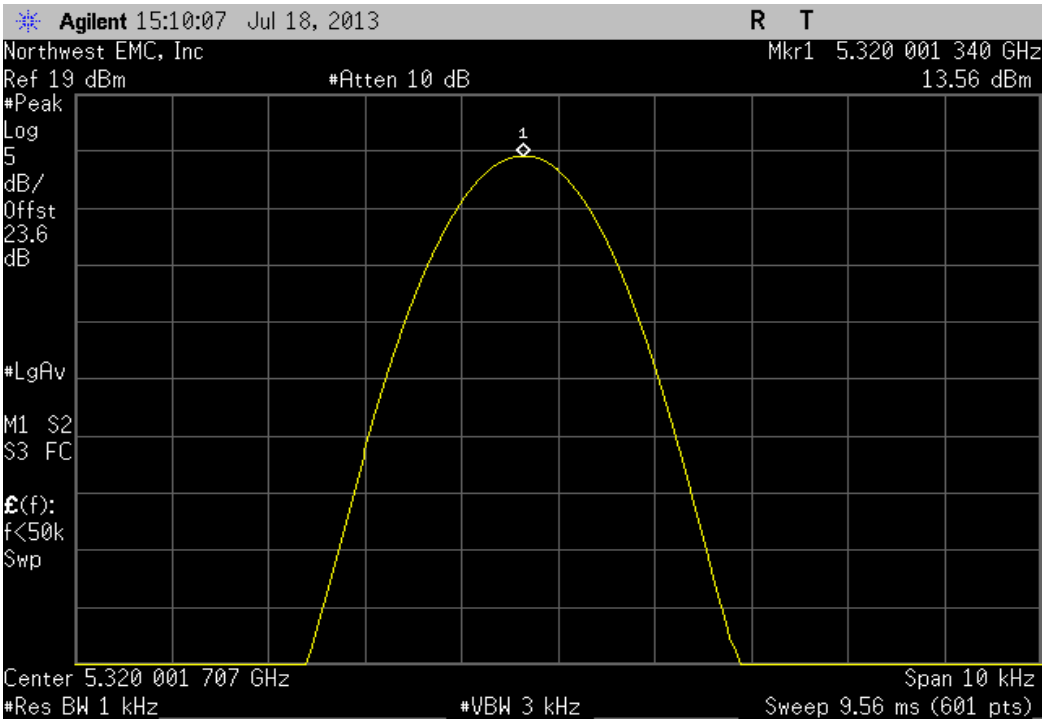


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.00099	5320	0.2	100	Pass

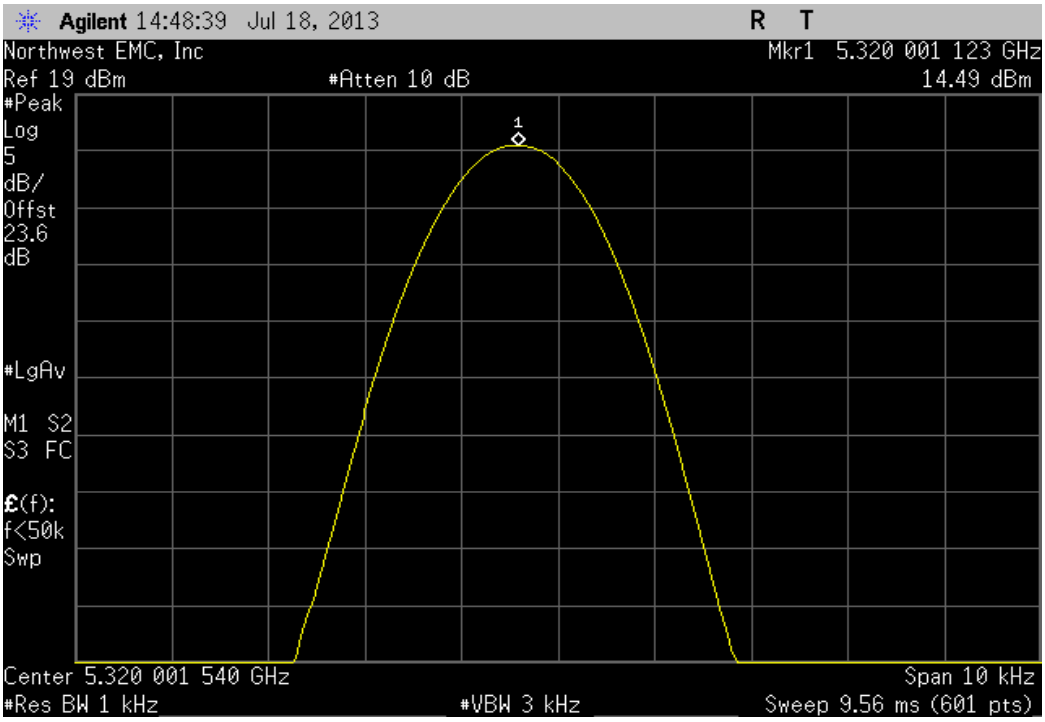


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.00134	5320	0.2	100	Pass

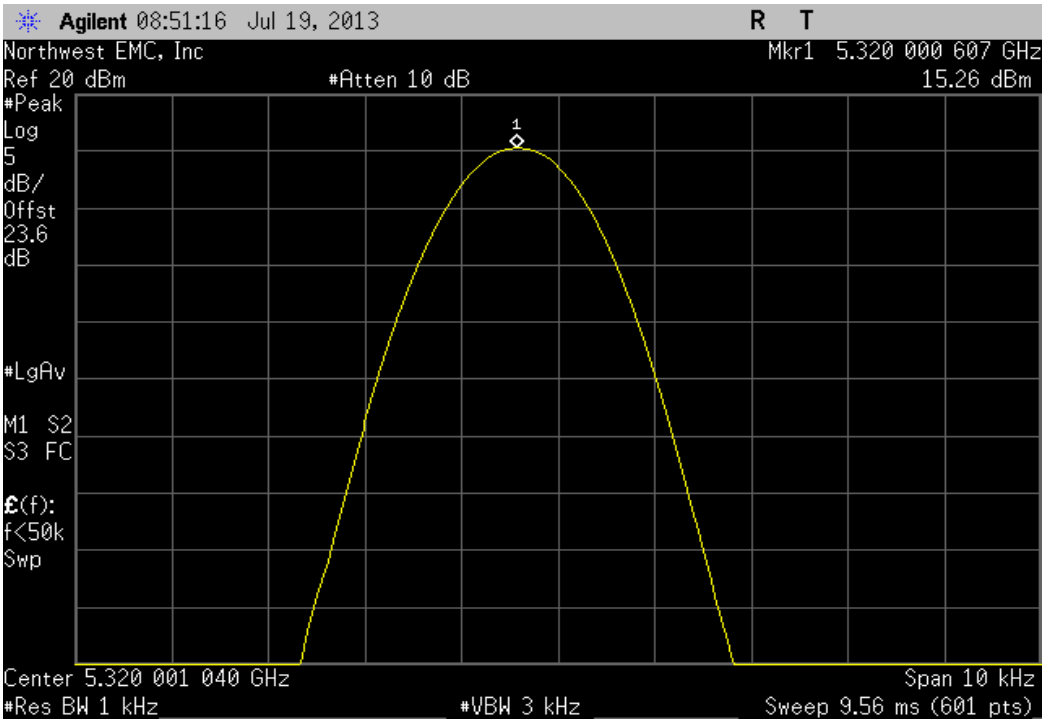


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.001123	5320	0.2	100	Pass

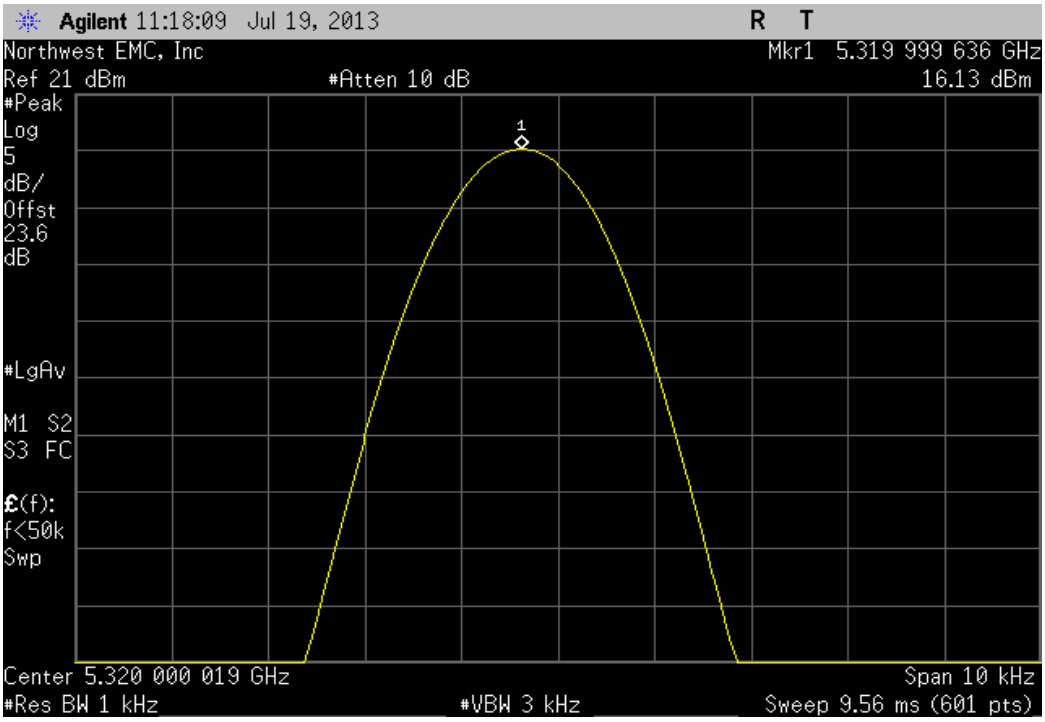


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000607	5320	0.1	100	Pass

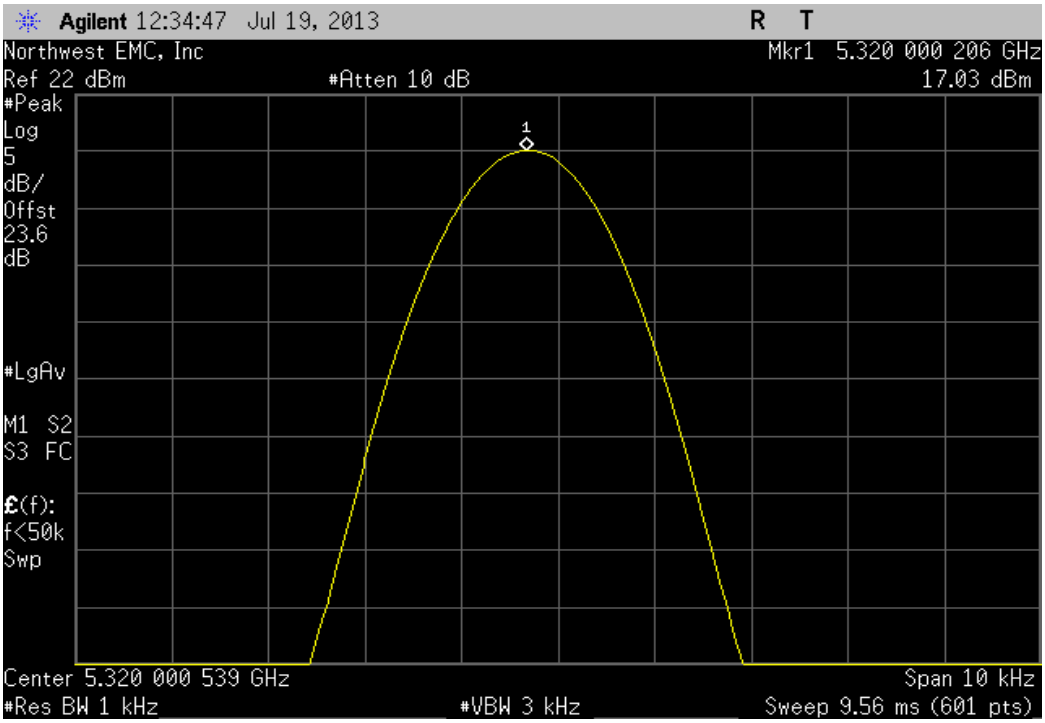


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5319.999636	5320	0.1	100	Pass

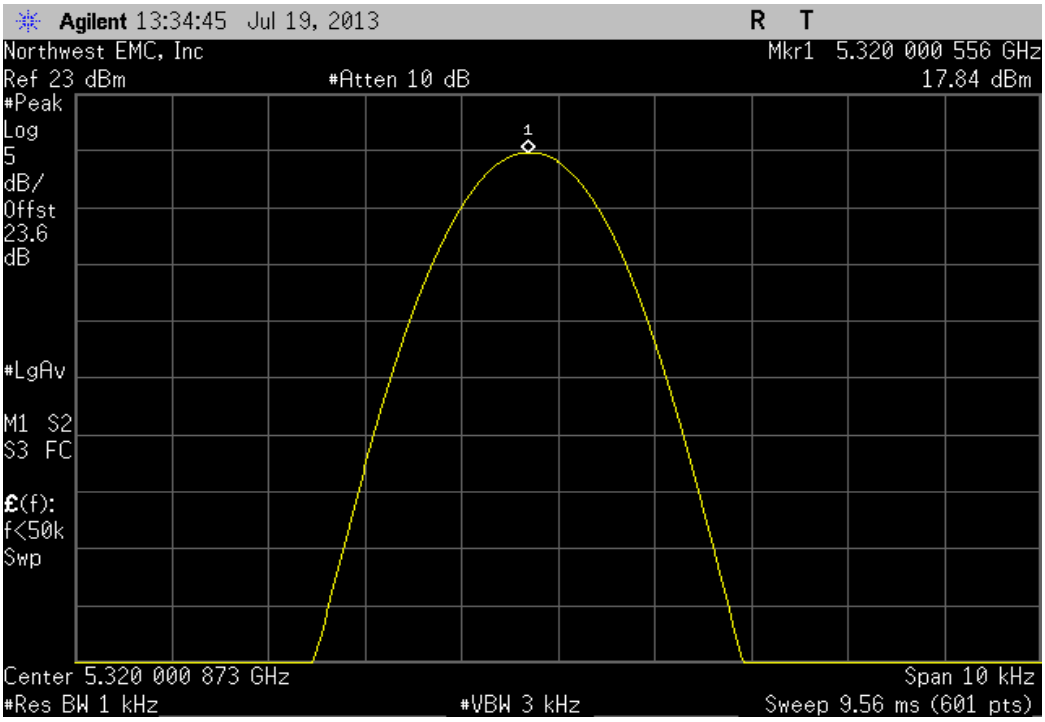


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000206	5320	0	100	Pass

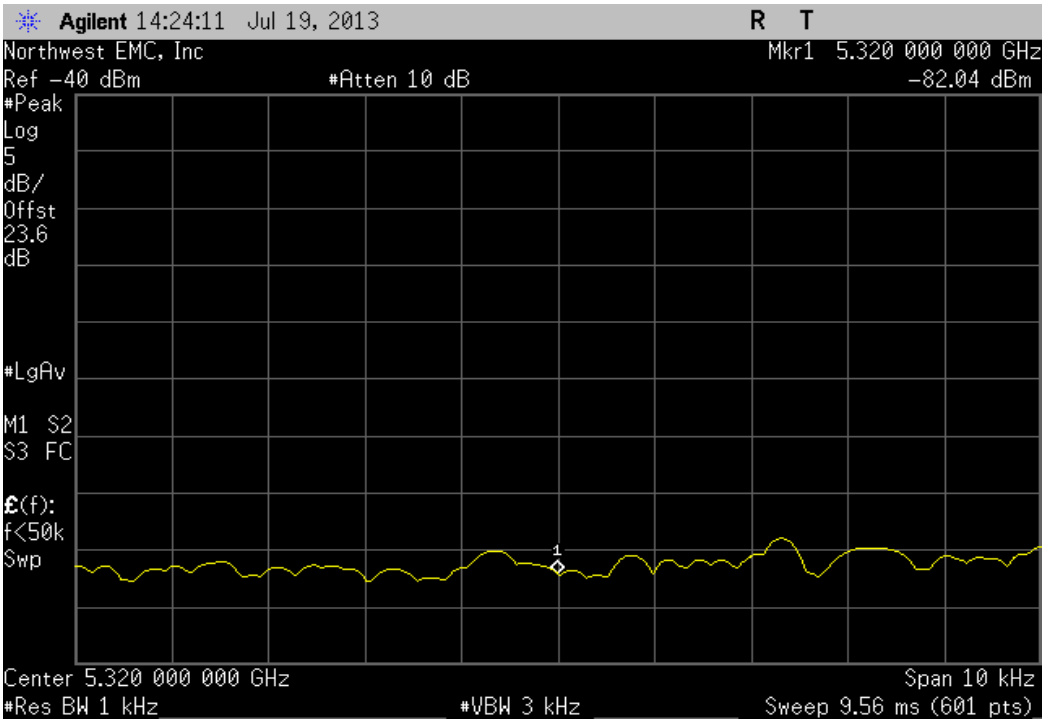


Frequency Stability - Antenna A

5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320.000556	5320	0.1	100	Pass

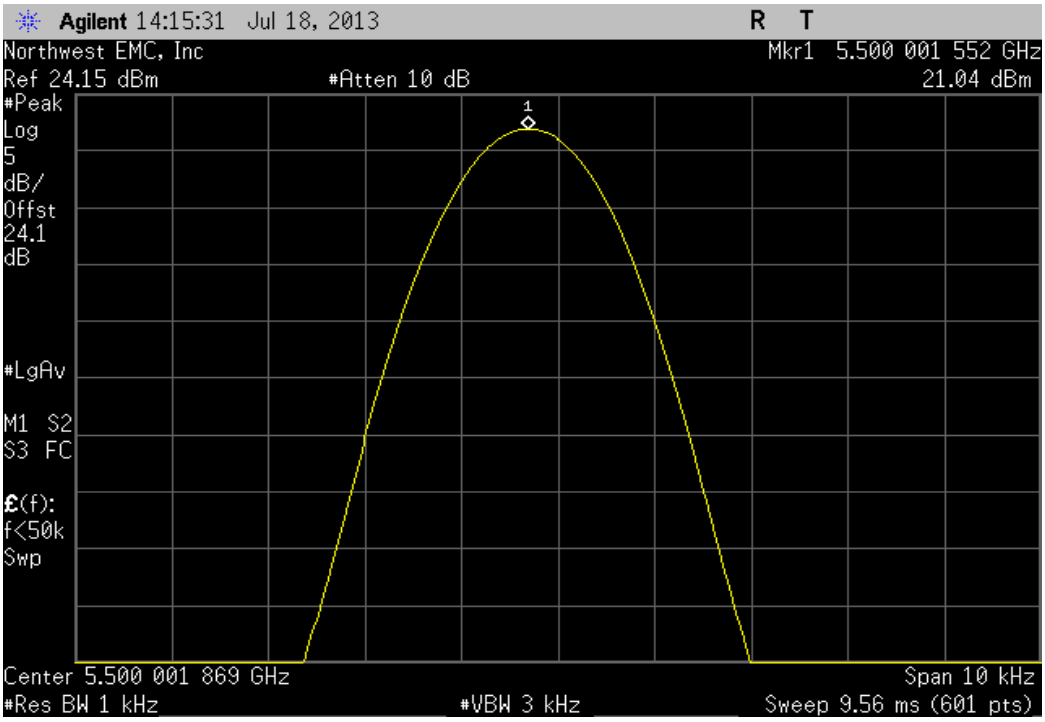


5250 MHz - 5350 MHz - High Channel, 5320 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5320	5320	0	100	Pass

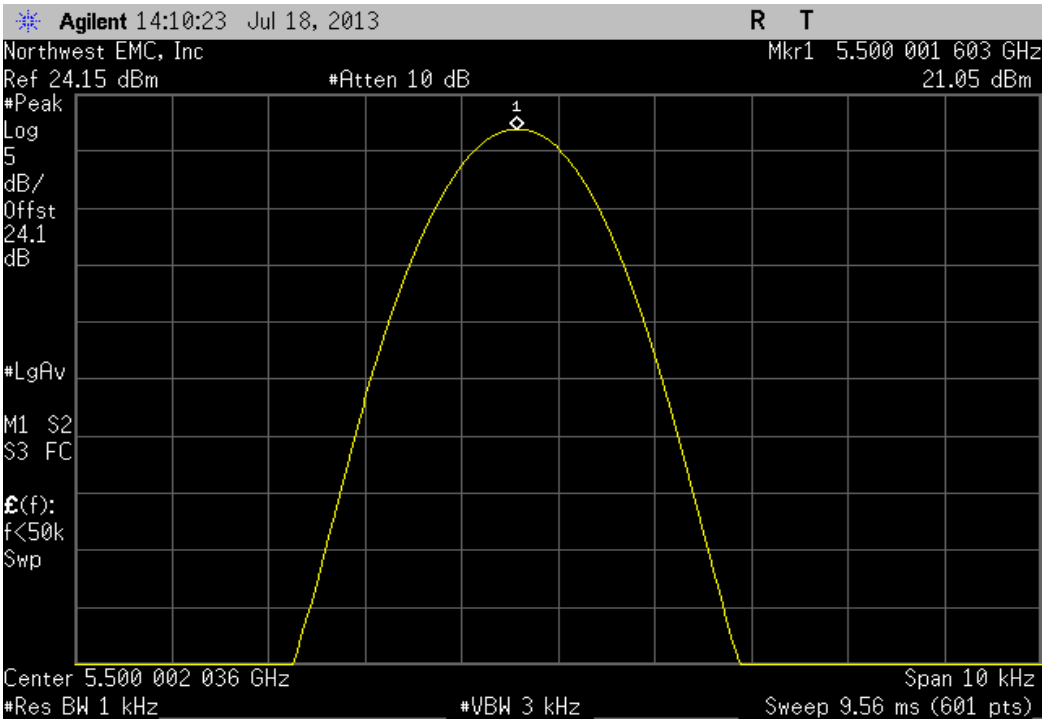


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001552	5500	0.3	100	Pass

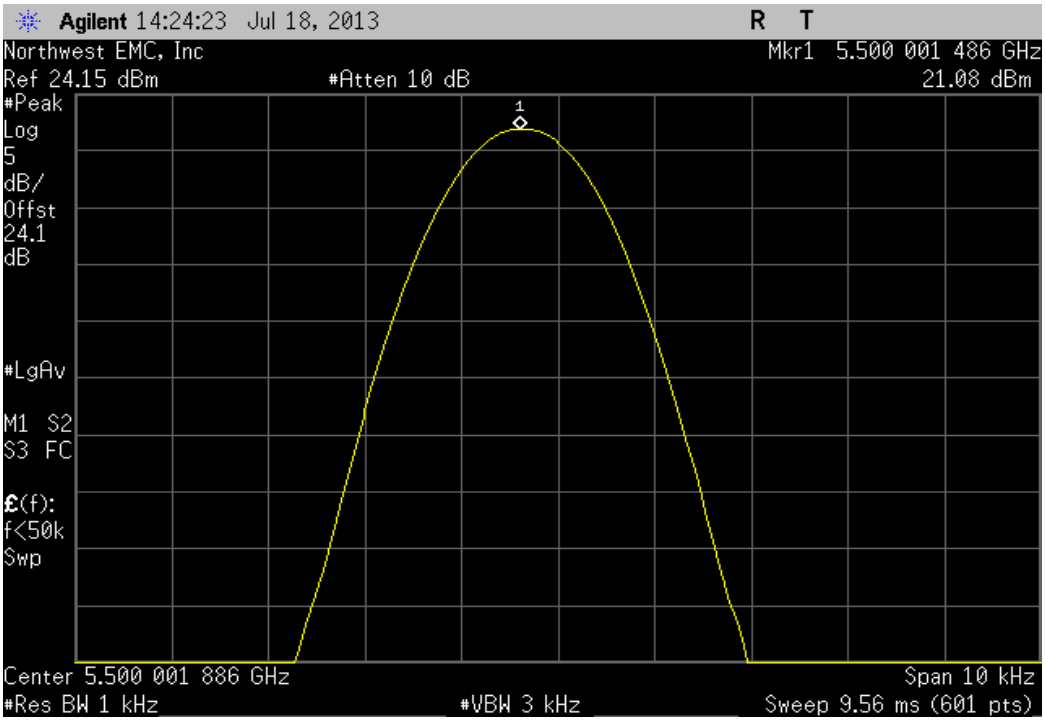


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001603	5500	0.3	100	Pass

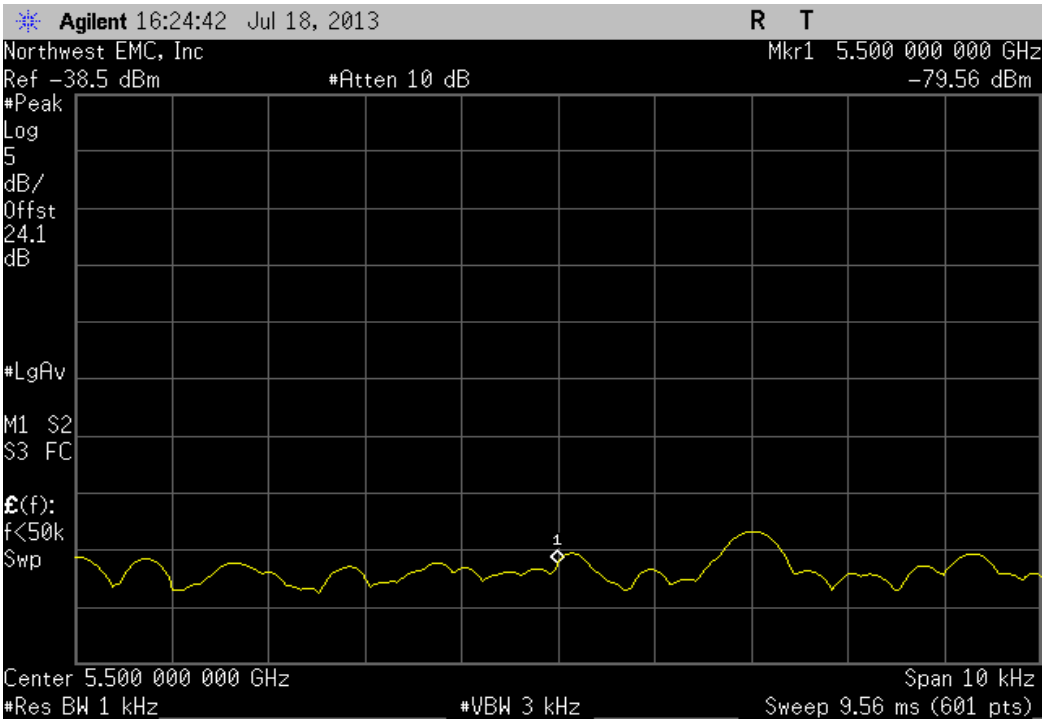


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001486	5500	0.3	100	Pass

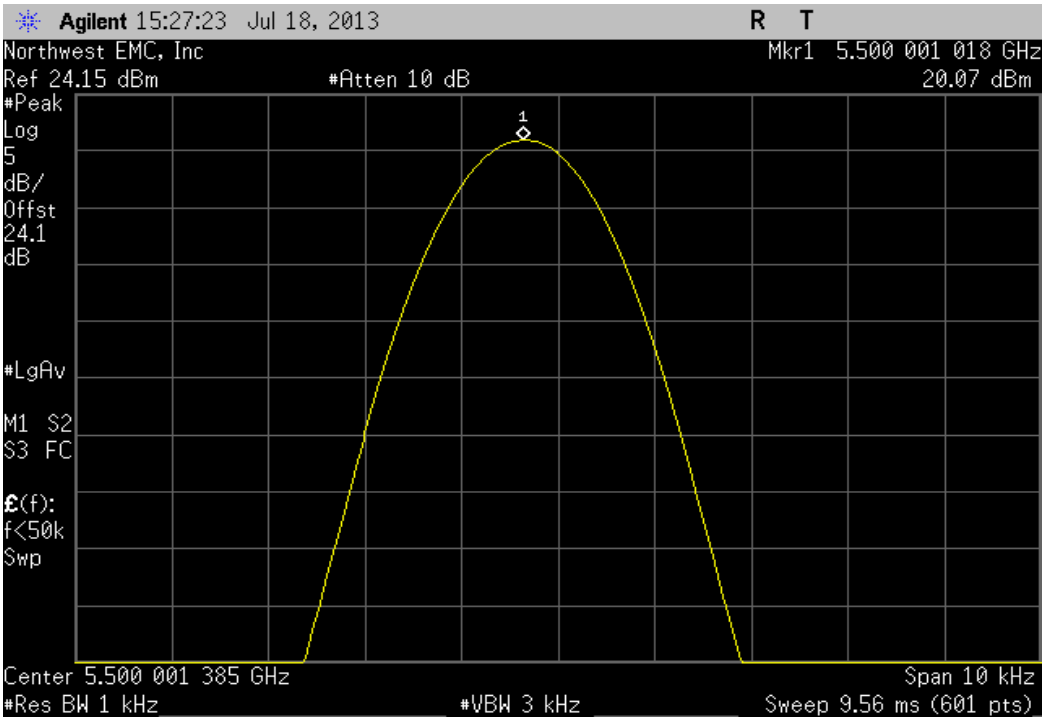


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500	5500	0	100	Pass

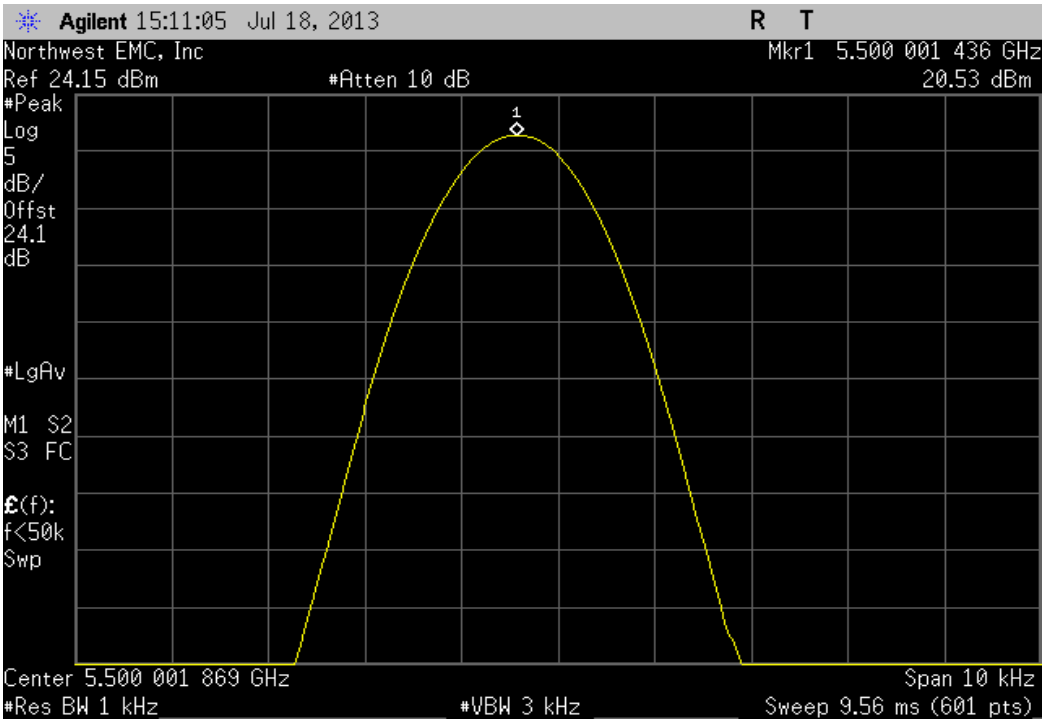


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001018	5500	0.2	100	Pass

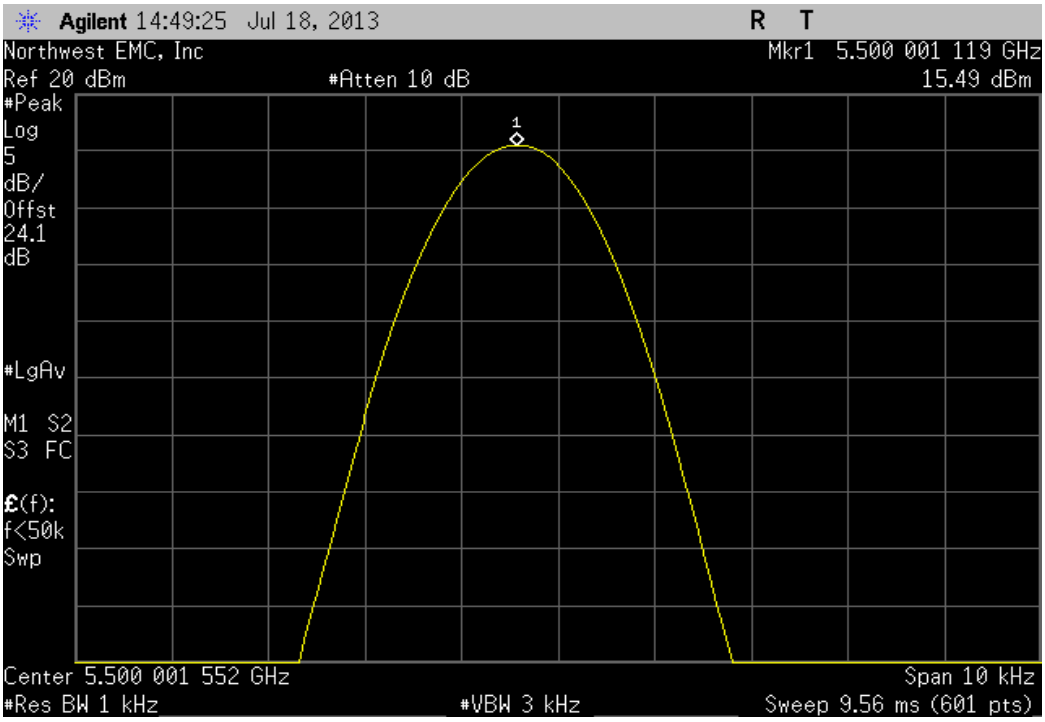


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001436	5500	0.3	100	Pass

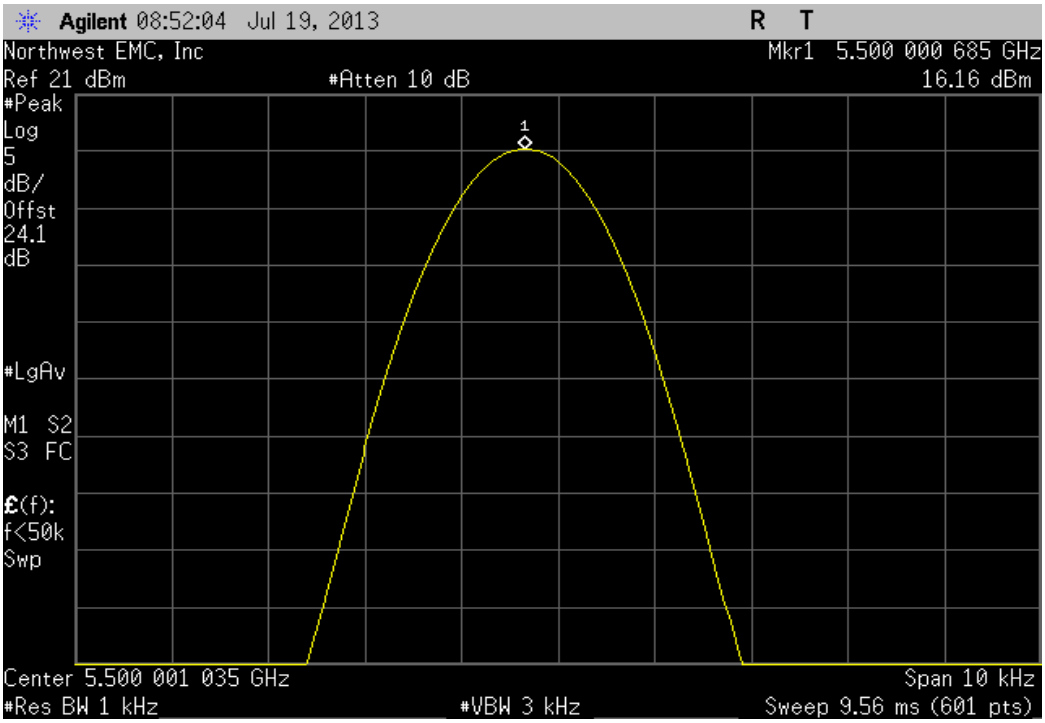


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.001119	5500	0.2	100	Pass

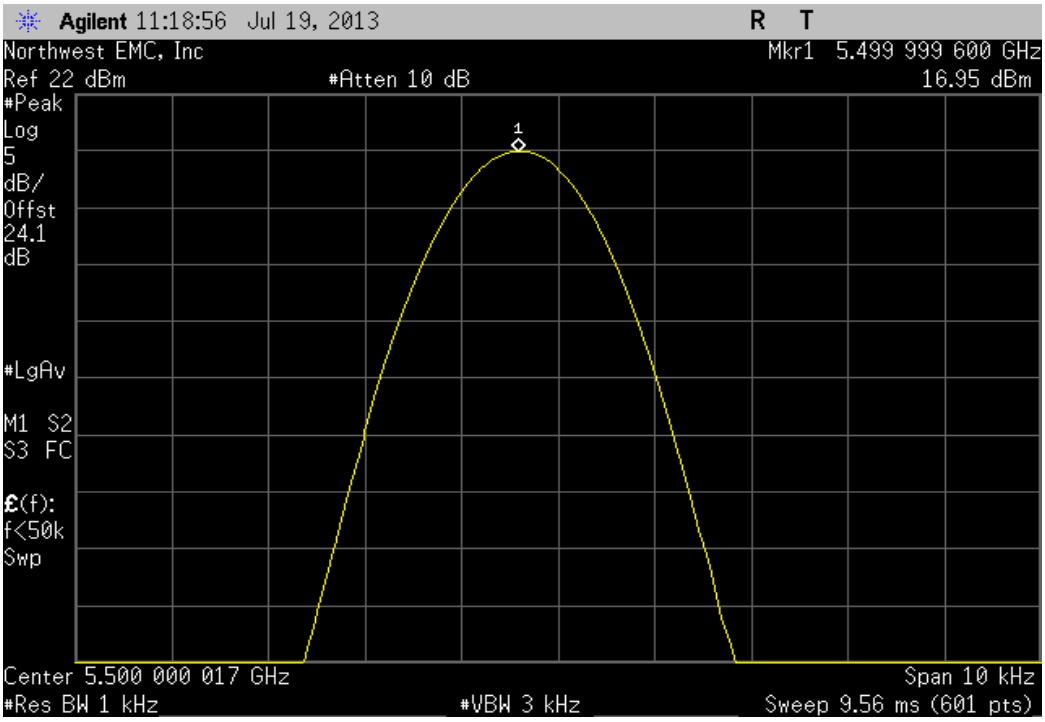


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.000685	5500	0.1	100	Pass

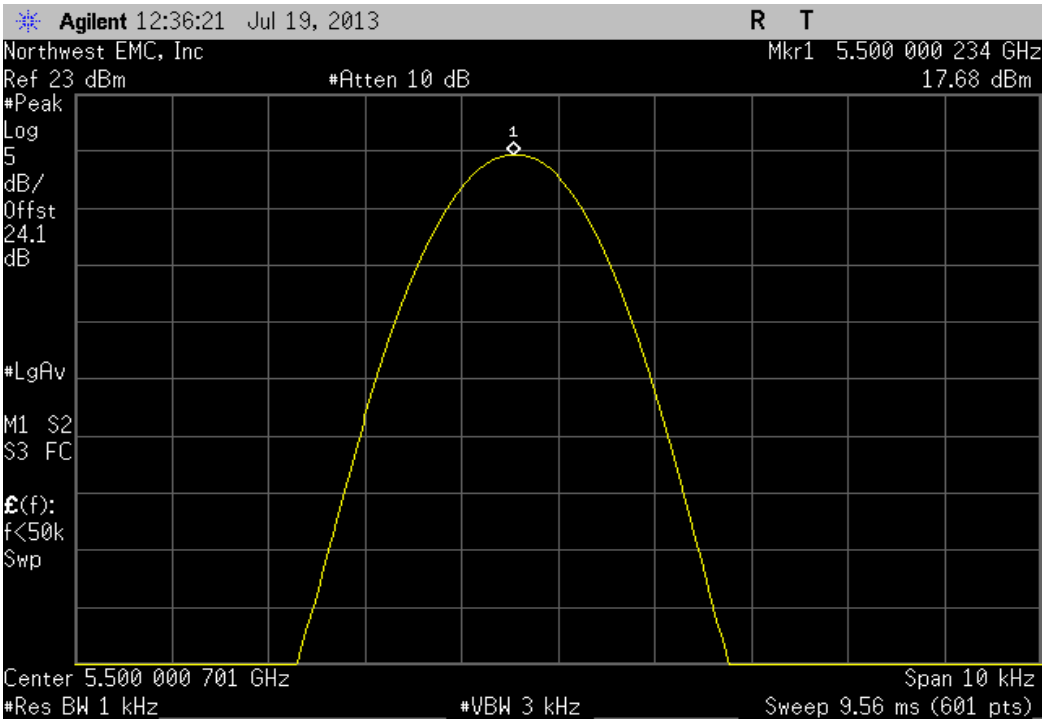


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5499.9996	5500	0.1	100	Pass

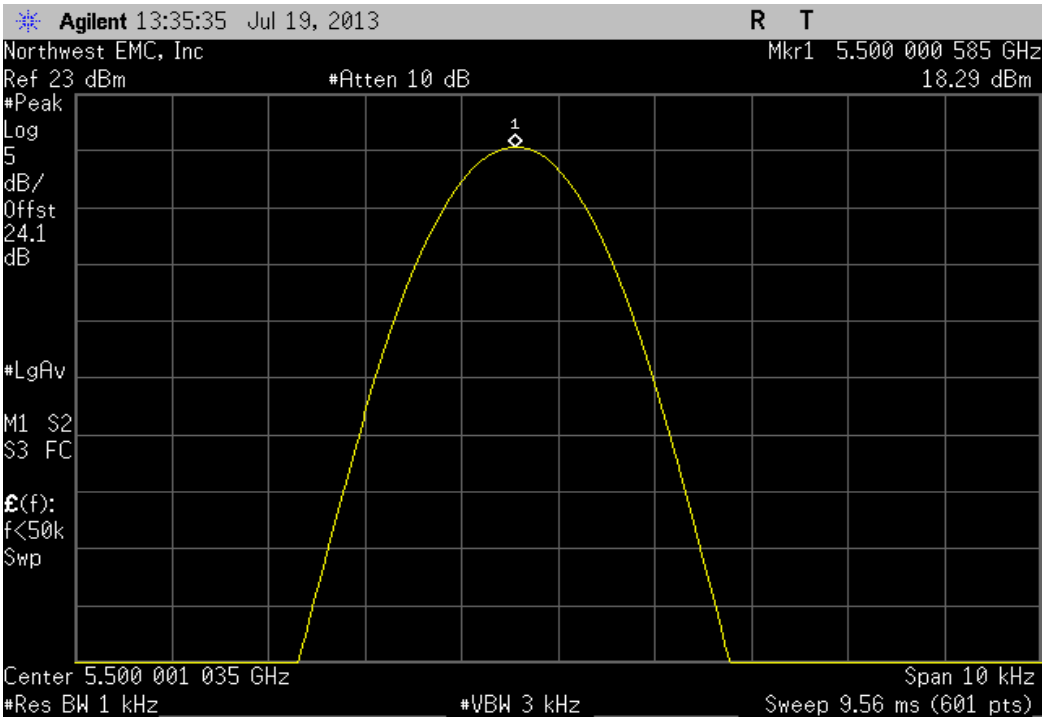


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.000234	5500	0	100	Pass

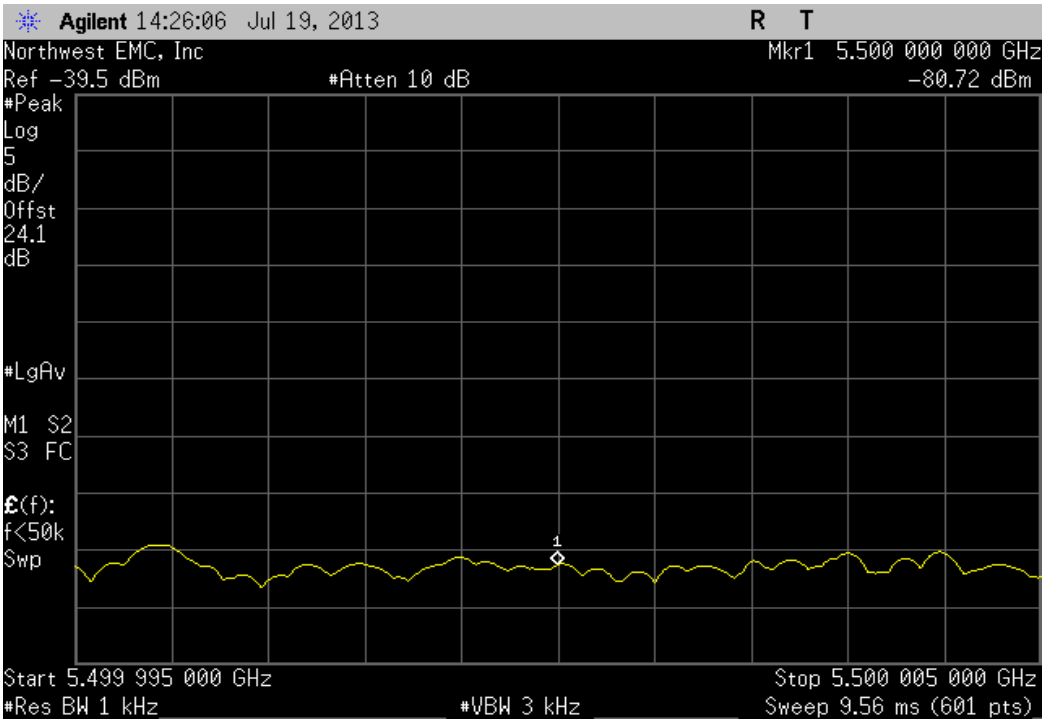


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500.000585	5500	0.1	100	Pass

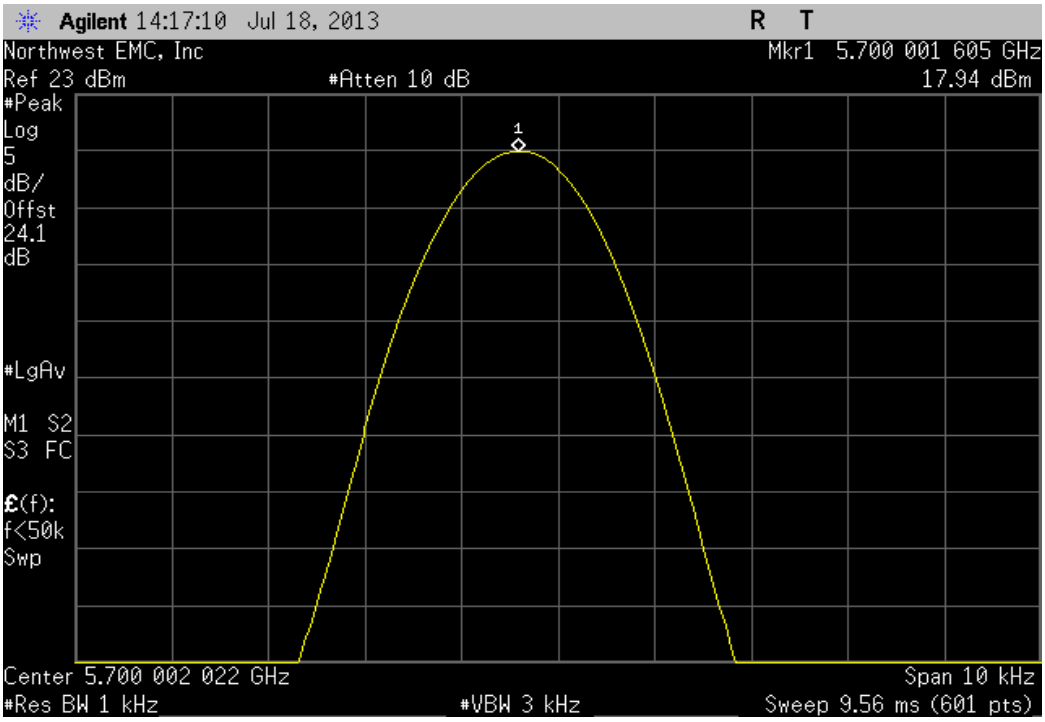


5470 MHz - 5725 MHz - Low Channel, 5500 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5500	5500	0	100	Pass

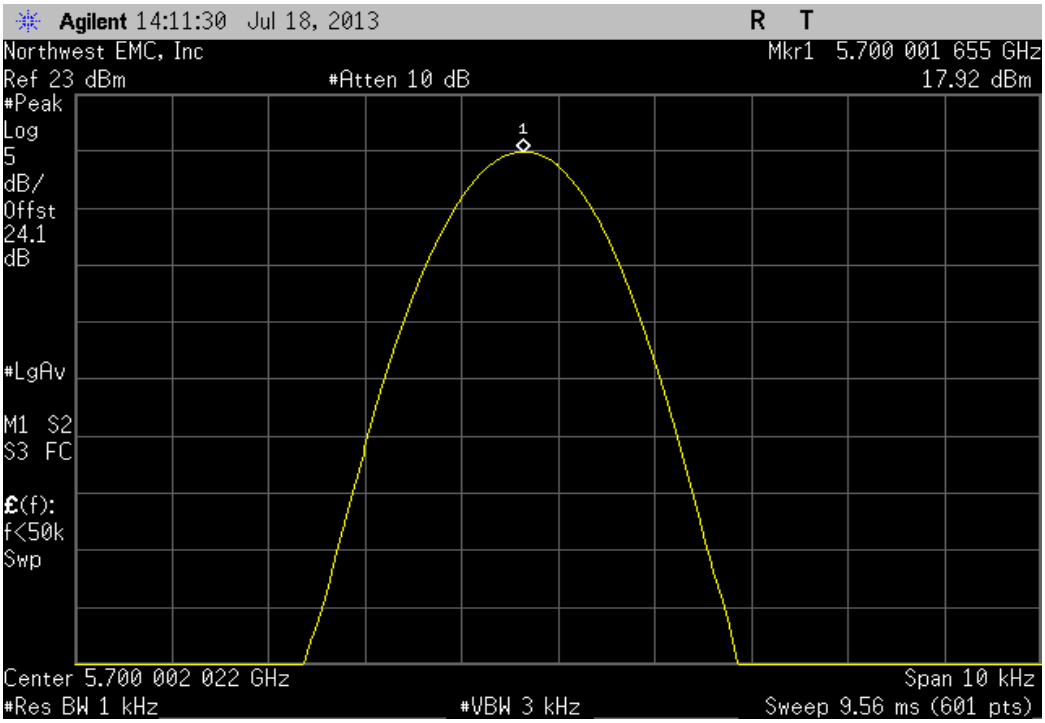


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001605	5700	0.3	100	Pass

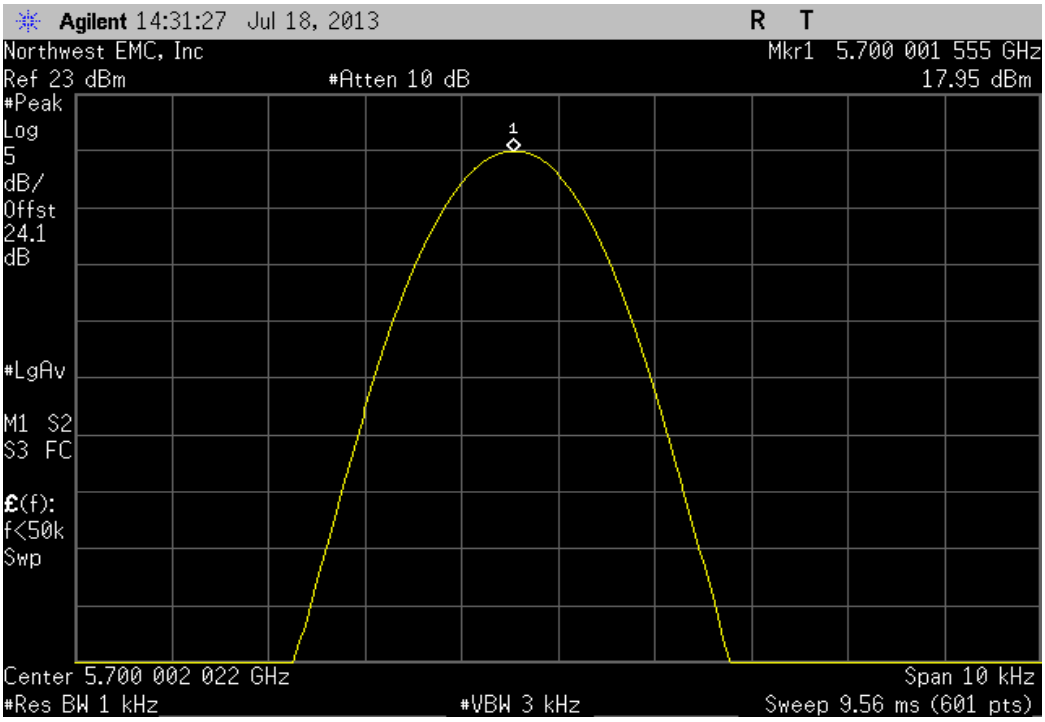


5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001655	5700	0.3	100	Pass

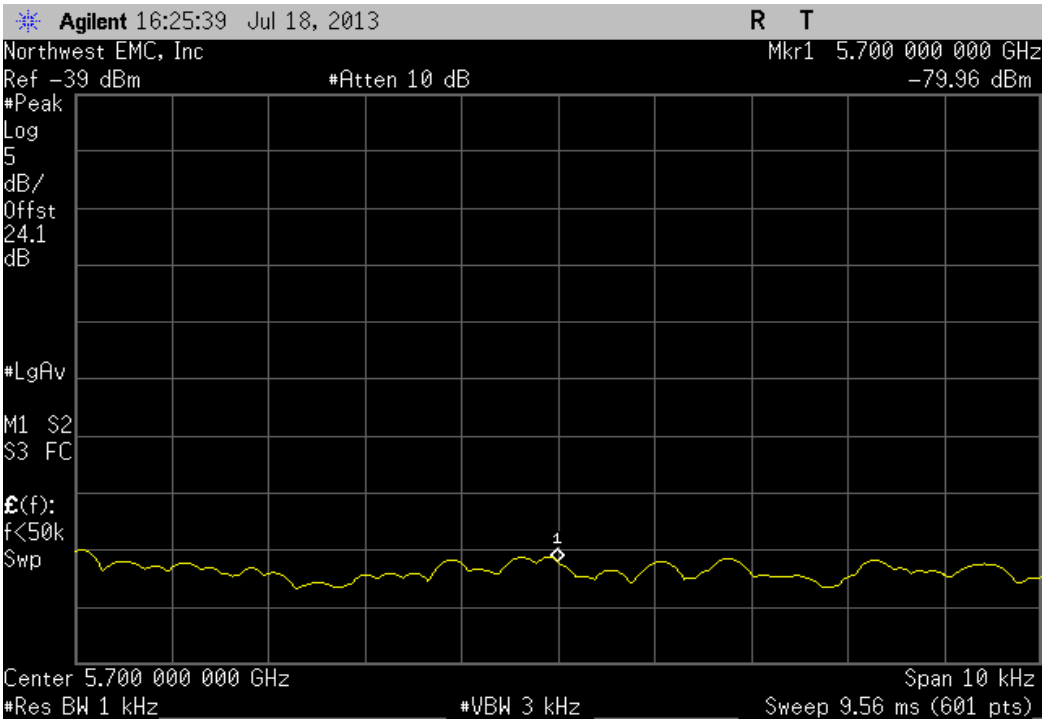


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Voltage: 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001555	5700	0.3	100	Pass

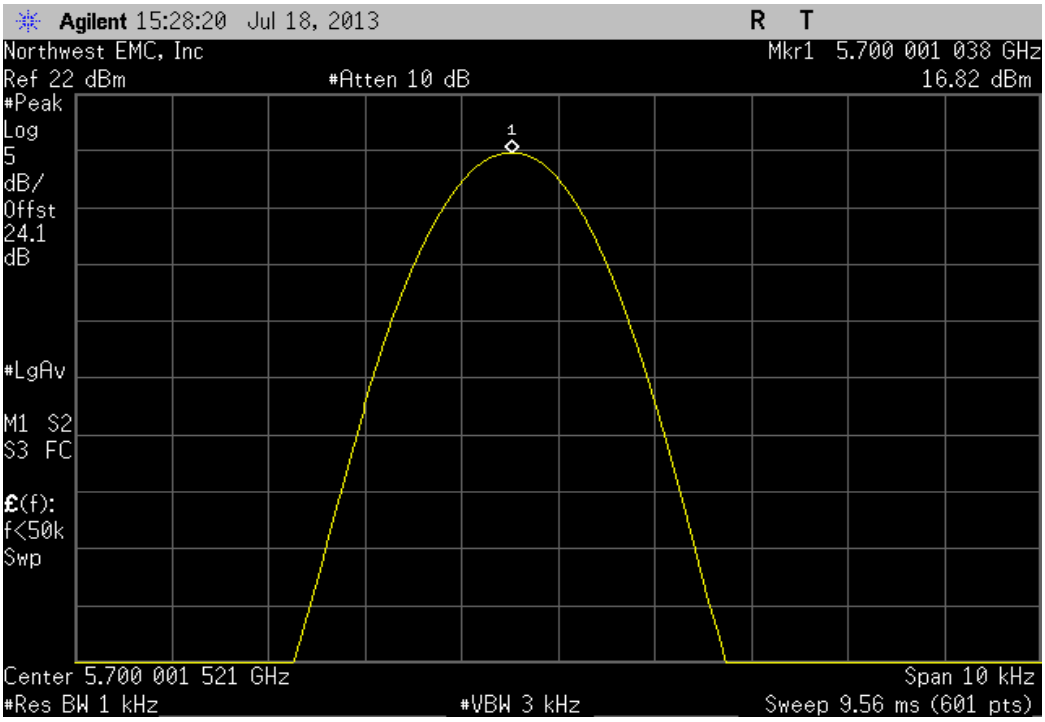


5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700	5700	0	100	Pass

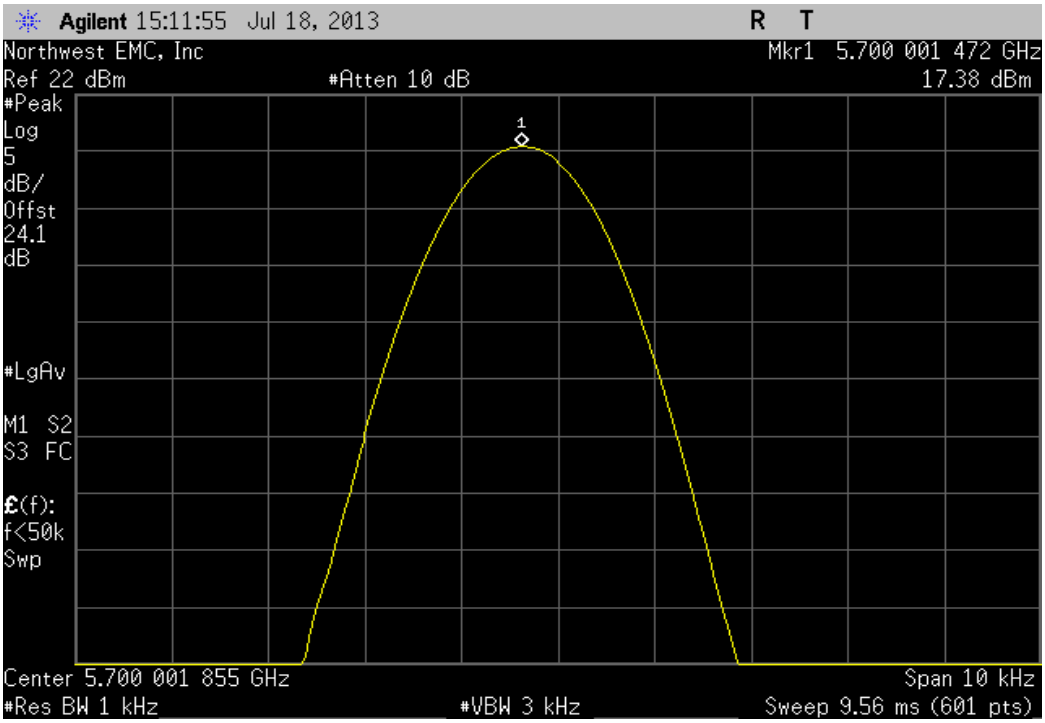


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001038	5700	0.2	100	Pass

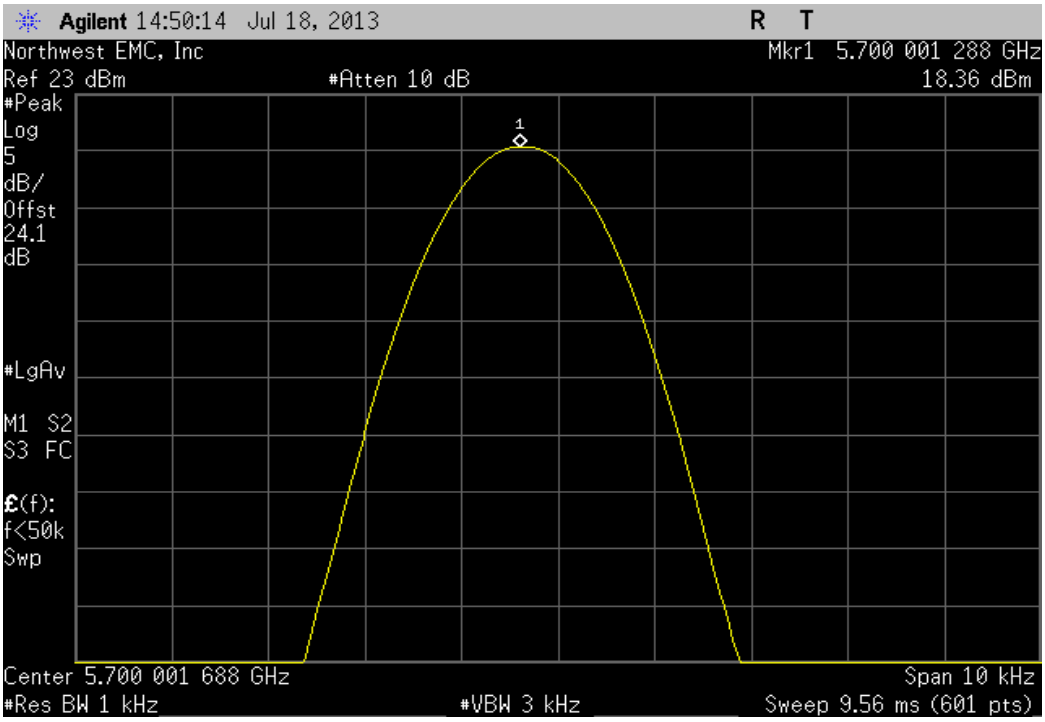


5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001472	5700	0.3	100	Pass

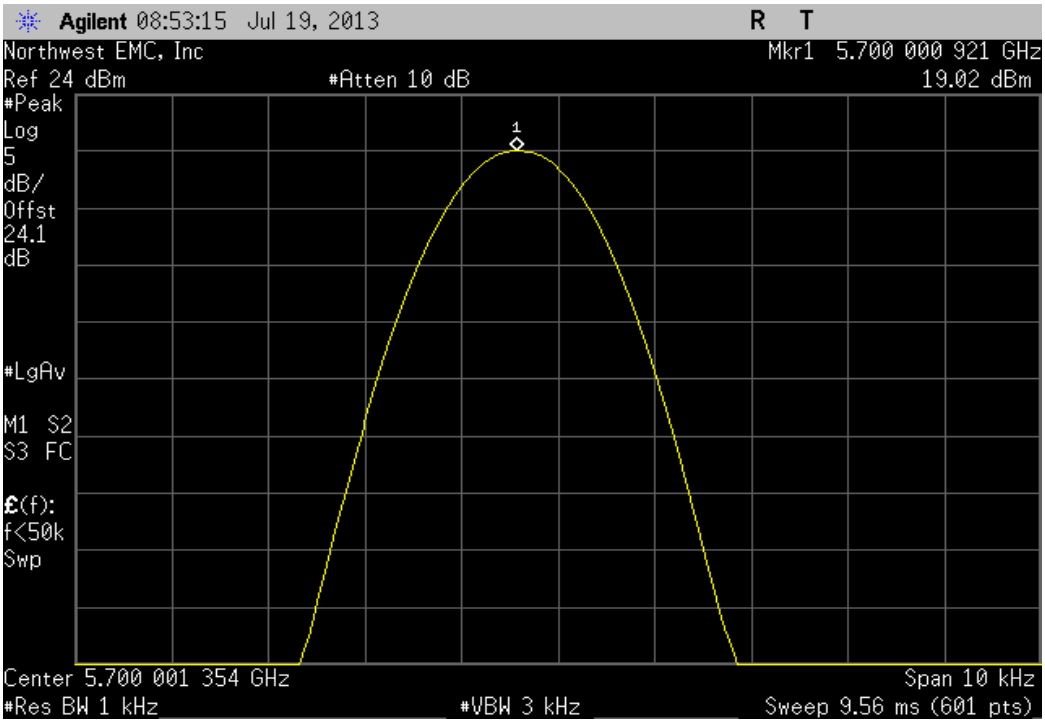


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.001288	5700	0.2	100	Pass

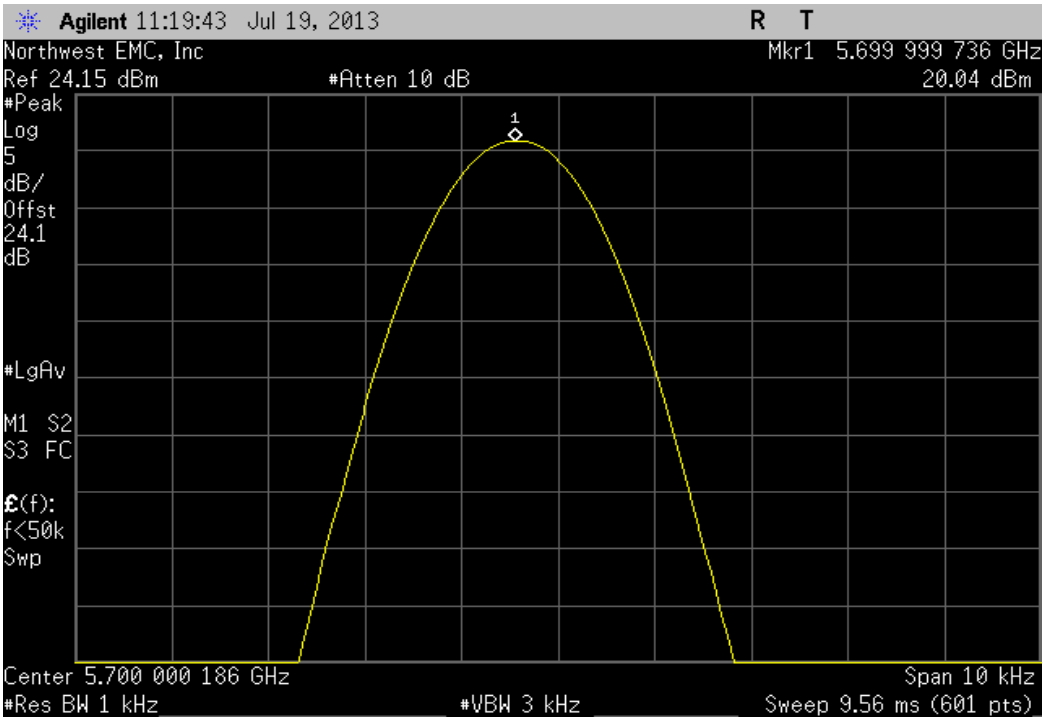


5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.000921	5700	0.2	100	Pass

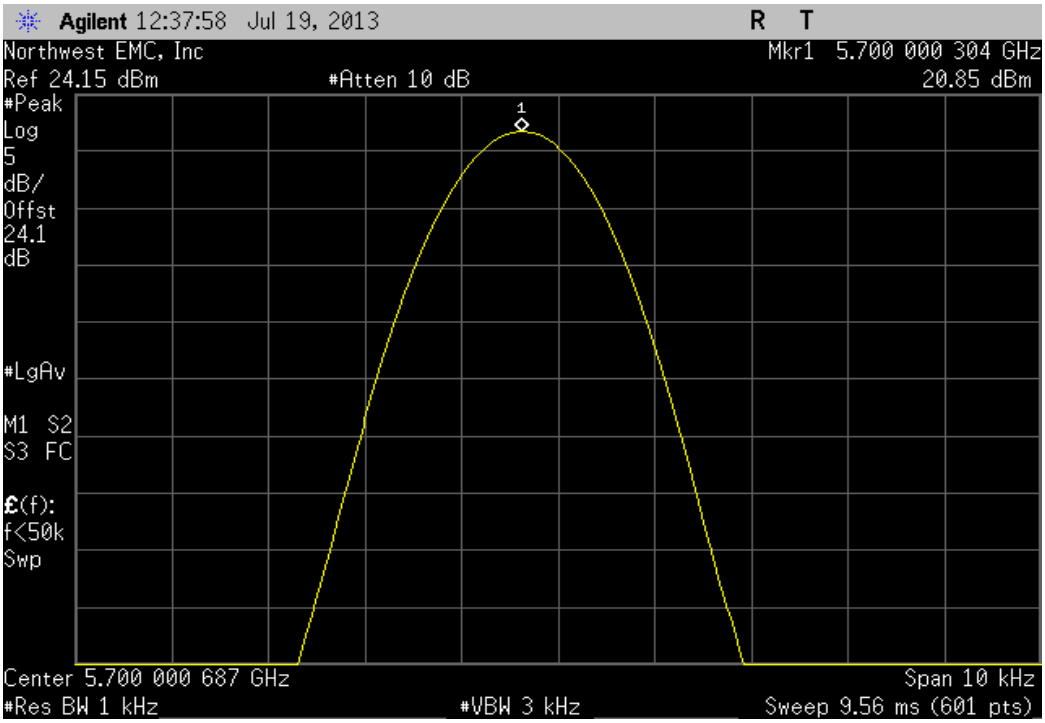


Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5699.999736	5700	0	100	Pass

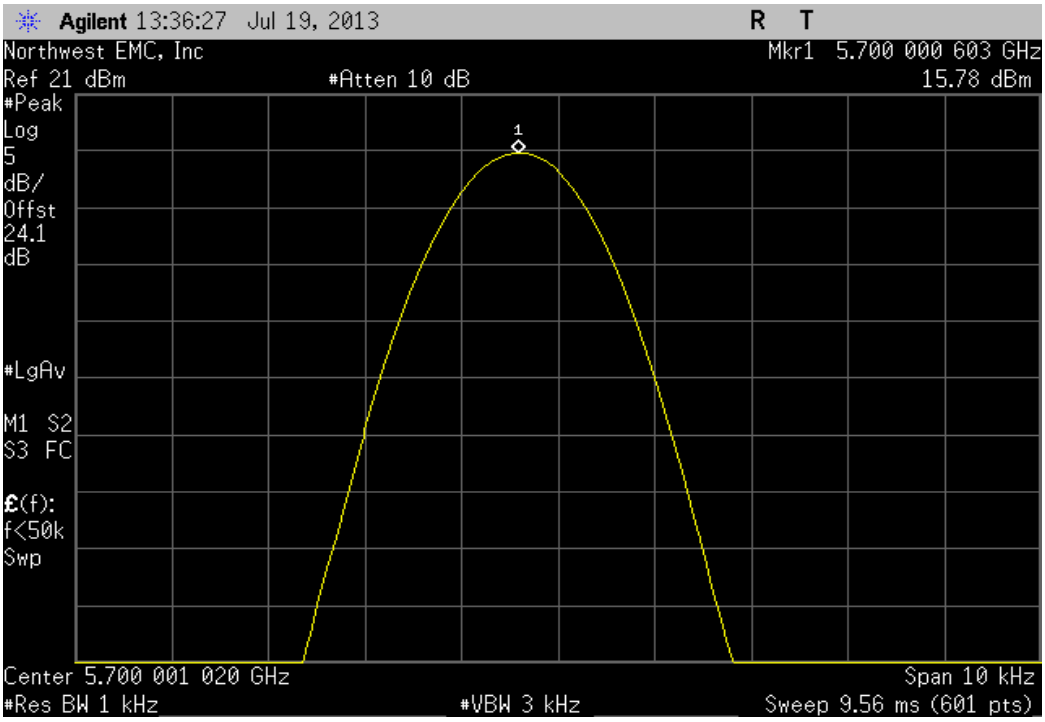
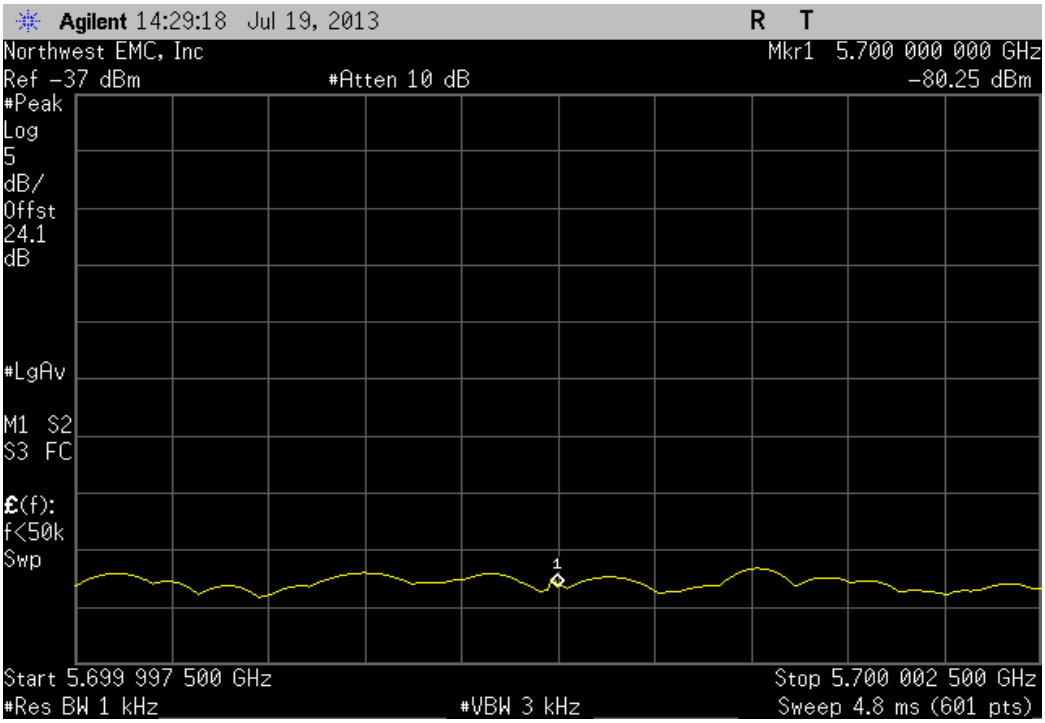


5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.000304	5700	0	100	Pass



Frequency Stability - Antenna A

5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700.000603	5700	0.1	100	Pass



5470 MHz - 5725 MHz - High Channel, 5700 MHz, Temperature: -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Result
		5700	5700	0	100	Pass